

nearly half the whole irrigated area in Shahabad, Patna, and Gya, he estimates the average outturn of irrigated dhan for the year to be $18\frac{7}{10}$ maunds of paddy per acre, or $12\frac{7}{10}$ maunds of rice.

The average of 1,227 experiments made by canal officers and subordinates from 1880-81 to 1887-88 on the yield of *average* crops is $16\frac{5}{10}$ maunds per acre of paddy, against $18\frac{7}{10}$ maunds, the yield of *average* crops in 1888-89, as estimated by Mr. Luson, based on experiments on good crops. Of the 26 experiments carried out by Mr. Luson himself, 23 were on land which had been continuously irrigated for nine years and upwards, and 16, by either Mr. Luson or Messrs. Burrows, Thomson, and Mylne, were on crops produced on *kerail* soil which has been stated to be unsuited for canal irrigation; the average yield of good crops being, nevertheless, 34 maunds $15\frac{7}{10}$ seers.

The fact that almost any soil will under favourable circumstances if regularly irrigated produce 34 maunds of dhan per acre can scarcely for the future be questioned.

In wheat, 57 experiments were made, and the balance both in grain and straw is in favour of canal water; but this result is reversed in three experiments made on barley.

68. The following statement shows the demands, collections, and balance of water-rates for the last five years:—

DEMANDS AND
COLLECTIONS.

YEAR.	DEMAND.			Remissions.	Net demand.	Collections.	Balance.	Percentage of collections to current demand.
	Arrears.	Current.	Total.					
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
1884-85	4,36,793	11,16,389	15,53,182	73,625	14,65,567	7,70,380	6,95,187	60.0
1885-86	6,96,308	8,67,708	15,64,016	1,36,308	13,76,444	9,76,388	3,99,381	121.1
1886-87	3,98,321	6,96,666	10,94,987	36,364	10,58,623	6,36,961	4,21,662	118.9
1887-88	2,81,562	7,25,819	9,97,381	26,586	9,70,795	8,10,886	1,59,909	71.5
1888-89	4,11,281	7,53,217	11,64,498	24,329	11,40,169	7,59,556	3,80,613	100.9

As usual, the figures given above are taken from those compiled by the Examiner of Accounts. The balance at the commencement of the year agrees exactly, and that at the close of the year very nearly, with the figures given by the Commissioner and Collector; there are differences in the remaining columns which approximately balance each other, the discrepancy at the close of the year being Rs. 4 only. The current demand includes Rs. 1,45,277 which, though due, are not legally recoverable until after the 1st of April.

ARREARS

69. The extent to which not only the current demand, but also the arrears of 1887-88 and earlier years have been worked off, is shown in the statement following. The figures are obtained from statements attached to the Commissioner's report:—

	Demand of 1888-89 how composed.	Collected or remitted.	Percentage of demand adjusted.	Balance outstanding at close of year.
	Rs.	Rs.		Rs.
Arrears of 1886-86 and previous years...	33,330	16,648	49.9	16,682
" 1886-87	25,848	17,066	66.0	8,782
" 1887-88	8,52,103*	2,95,630	33.9	5,56,473
Total of arrear demand outstanding on 1st April 1888	4,11,281	3,29,344	80.0	81,937
Current demand of 1888-89...	7,50,340	4,51,660	60.2	2,98,680†
Gross demand, including arrears	11,61,621	7,81,004	67.2	.....
Total outstanding at close of year	.....	.....	.....	3,80,617†

* Includes Rs. 1,30,649 not legally recoverable within the year 1887-88.

† Includes Rs. 1,45,277 not legally recoverable within the year 1888-89.

There has been a small diminution in the arrear balance on the 1st of April 1889, as compared with that on the 1st of April 1888. The balance due on account of the year immediately preceding that current has increased from Rs. 25,846 to Rs. 56,423, whilst the balance on account of previous years has been reduced from Rs. 33,329 to Rs. 25,464.

The effect of the agitation which led to the appointment of the Committee had an unfavourable effect on the collections of the year, the Collector of Shahabad giving it as his opinion that "the work was thrown back by nearly two years." He adds "that instances have come to the notice of our officers where the rate-payers of certain villages expressed their regret that they ever joined the agitation and withheld payment, inasmuch as the pressure of accumulated arrears was too much for them." As regards the current year's demand, the Superintending Engineer notices that the demand statements reached the Collector at a later date than usual, a result ascribed to two causes—1st, the detention of demand statements including items to which objections had been preferred until a decision had been arrived at, and 2nd, the increased area under irrigation. Complaint is made in the Collector's reports of the delay which, as noted above, occurred in the receipt of the demand statements, the reasons given by the Sub-Engineer for their late despatch must be accepted as fairly satisfactory.

70. The following statement compares by districts the operations of the year under review with those of the preceding year:—

DISTRICT.	ARREARS DUE FOR IRRIGATION EFFECTED IN PREVIOUS YEARS.				DEMANDS FOR IRRIGATION EFFECTED IN 1888-89.			
	PERCENTAGE OF TOTAL DEMAND.				PERCENTAGE OF TOTAL DEMAND.			
	Demand.	Collections.	Remissions.	Outstanding at end of year.	Demand.	Collections.	Remissions.	Outstanding at end of year.
Shahabad—								
1888-89	100.0	78.7	4.8	16.3	100.0	66.3	0.3	33.4
1887-88	100.0	66.0	13.8	20.2	100.0	54.8	0.7	44.5
Patna—								
1888-89	100.0	55.2	5.7	38.0	100.0	18.6	0.02	81.3
1887-88	100.0	45.5	5.6	48.9	100.0	24.0	0.2	75.8
Gya—								
1888-89	100.0	58.4	0.3	11.3	100.0	48.6	1.0	50.3
1887-88	100.0	59.0	1.7	9.3	100.0	42.3	0.2	57.5
Average—								
1888-89	100.0	74.9	5.1	19.9	100.0	59.3	0.3	39.8
1887-88	100.0	64.8	6.7	28.5	100.0	50.7	0.5	48.8

The Commissioner of Patna makes the following observations on the percentage of the total demand, arrears and current, collected during the year:—

"From the above figures it will be seen that in Shahabad 72 per cent. of the total demand was adjusted during the year under report—a result which may be considered fair; while the adjustment in Patna was only 41, which is not satisfactory. The Collector of Patna states that the present circle officer has effected some improvement in the collections, but there is yet much room for further improvement."

The Executive Engineer of the Eastern Sone Division states that the delay in recovering arrears must cause loss of revenue to Government, and has generally a demoralizing effect on the cultivators.

If the demands received in March, which are practically not recoverable during the year, are excluded, the percentage of collections to the total demand, including arrear balances, is for Gya 65 per cent., Patna 38 per cent., and Shahabad 77 per cent.

The result of the year's collecting operations has been good in Shahabad, fair in Gya, but very bad in Patna.

REMISSIONS.

71. The remissions granted during the year are Rs. 2,196 less than those of the preceding year, as shown below:—

				1888-89.	1887-88.
				Rs.	Rs.
By canal officers	...	...	...	10,776	6,911
By civil officers	...	...	...	13,553	19,614
Total	...	...	...	24,329	26,525

The statement above is based on the figures contained in the Examiner's accounts.

For the purpose of comparing the accuracy of the demand statements of the year with those of that previous it is necessary to take into account refunds and cancelled demand statements not replaced by others of equal amount. Taking into account these items, which are equally remissions and excluding remissions by civil officers the figures for the last two years are shown below:—

				Rs.
1888-89	...	...	...	16,234
1887-88	...	...	...	18,813

Remissions by civil officers are those arrears which it was found necessary to write off as irrecoverable owing to the persons assessed having absconded or become bankrupt.

The remissions by canal officers may be divided thus:—

				Percentage of remissions and refunds to gross demand.	
				1888-89.	1887-88.
Eastern Sone Division	...	...	...	1.09	0.74
Arrah Division	...	...	...	0.72	1.95
Buxar Division	...	...	...	1.20	1.24

showing, except in the case of the Eastern Sone Division, a further advance on last year's results, which were considered to be satisfactory.

From the Examiner's accounts it would appear that the totals of refunds, remissions and irrecoverable item amounted to Rs. 36,940 in 1888-89 and Rs. 41,856 in 1887-88. These are *actuals* and include items of former years finally dealt with in 1888-89. On this question of remissions and refunds further information is necessary, so as to show what percentage of the assessments of any year are finally remitted, refunded or written off as irrecoverable. The percentage in Bengal on account of the peculiar circumstances under which irrigation there is effected, must always be considerable as compared with other Provinces, but undoubted progress is being made, and it is desirable to show this. The matter should not be lost sight of.

REVENUE ESTABLISHMENT.

72. The expenditure on the Revenue establishments employed during the last two years is shown below:—

		1888-89.		1887-88.	
		Amount.	Percentage on collections.	Amount.	Percentage on collections.
		Rs.		Rs.	
Permanent and temporary establishments, such as zilladars, ameens, &c.	...	(a) 54,325	7.15	(b) 53,254	10.25
Establishment employed under Collectors	...	33,316	4.38	30,466	5.85
Headmen's and patwaries' fees	...	70,608	9.30	51,523	9.92
Total	...	1,58,249	20.83	1,35,243	26.02

(a) Inclusive of Rs. 2,270 for water regulation establishment.

(b) Ditto 2,334 ditto ditto.

The above figures have been taken from the Examiner of Accounts' memorandum.

There is a small increase in the expenditure on the establishment employed under both the Engineers and Collectors, due to the larger area irrigated and the increased collections. The increased sum disbursed on account of headmen's fees includes Rs. 10,949 wholly in the Arrah Division of arrears previous to 1887-88 disbursed in 1888-89, and to that extent the expenditure is unduly high; the remaining increase is a consequence of the increase in the area irrigated and in the collections.

73. The following statement shows the approximate cost of measuring lands brought under assessment during the year under review and of preparing demand statements :—

DIVISIONS.	Areas measured during the year and assessed.	COST OF MEASURING CROPS.		COST OF PREPARING DEMAND STATEMENTS.	
		Total.	Per acre.	Total.	Per acre.
	Acres.	Rs.	Pies.	Rs.	Pies.
Eastern Sone ...	34,356	713	3-98	1,017	6-68
Arrah ...	70,481	2,838	7-73	2,518	6-85
Buxar ...	72,469	2,483	6-57	1,630	4-32
Total, 1888-89 ...	177,306	6,034	6-53	5,165	5-59
Total, 1887-88 ...	161,069	5,533	7-00	4,594	5-53

It will be seen from the above table that the increase in the area assessed has been followed by a reduction in the cost per acre of making the assessment.

74. The Superintending Engineer has attached to his report very complete lists of complaints and applications received during the year divided under three main heads:—(I) Objections to demand statements or ordinary applications for remission; (II) Complaints against orders actually passed other than those imposing an assessment; (III) Applications in connection with irrigation not involving complaints against orders passed by or the action of canal officers. Both complaints and applications are classified under numerous heads and sub-heads in appendices XIV and XV to the Superintending Engineer's report. In former years a less elaborate classification was adopted, but the numbers of complaints for the last two years can to a certain extent be classified under the main heads mentioned above, and figures showing the results are given in the subjoined table :—

DIVISION.	(I.)—ORDINARY REMISSION.				(II TO IV.)—OTHER COMPLAINTS.			Total complaints received during year, excluding those pending from previous year.	Pending.
	Received during the year and pending from previous year.	Disposed of.		Pending.	Received during the year and pending from last year.	Disposed of.	Pending.		
		Remission allowed.	Remission refused.						
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Eastern-Sone ...	1,512	483	880	470	58	47	9	1,518	470
Arrah ...	3,591	1,094	1,608	985	441	357	84	3,688	1,019
Buxar ...	1,867	624	339	404	220	207	13	1,884	417
Total, 1888-89 ...	6,970	2,201	2,820	1,860	717	611	106	7,070	1,916
Total, 1887-88 ...	6,745	2,585	3,838	625	Not recorded.				

Of the 5,161 complaints regarding assessment disposed of, remission was allowed in 42.6 per cent. of the cases, against 37.3 per cent. in the previous year. The Superintending Engineer remarks that the small increase in the number of complaints is apparent rather than real owing to the fact that not unfrequently the same complaint is made to the Subdivisional Officer, the Executive Engineer, the Collector, and the Superintending Engineer, each of which now appears as a separate number in the register. The demand for water in October for new irrigation also led to many complaints, as the cultivator is never satisfied to pay water rates unless the crop is satisfactory, and this was necessarily not the case where water was applied for and received at the last moment. The explanation may be accepted as sufficient as regards the apparent increase in the numbers of complaints, there being no doubt that it is due to a more rigid enumeration of the number of complaints, and the character of the season being such as to induce objections to the assessments. The same cannot, however,

be said as to the number of complaints pending at the close of the year, especially in the Arrah Division, for which no sufficient reason has been given.

APPEALS.

75. During the year 23 appeals against the orders of canal officers were preferred to the Collector; of these 3 were allowed, 15 dismissed, and 5 pending at its close.

CERTIFICATE PROCEDURE.

76. The number of certificate cases filed and disposed of during the year under review, as compared with the year preceding, in the districts of Shahabad, Patna, and Gya, is shown below:—

	SHAHABAD.				PATNA.				GYA.			
	1884-85.		1887-88.		1885-86.		1887-88.		1885-86.		1887-88.	
	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.	Number.	Amount.
Cases for disposal—												
1. Cases pending at the close of the preceding year.	947	17,943	5,602	41,193	4,045	21,154	2,421	14,958	167	2,391	43	417
2. Cases instituted during the year	2,945	36,974	1,617	23,293	1,129	6,103	2,902	18,611	130	9,944	244	3,336
Total	3,915	54,917	7,219	64,486	5,174	27,257	5,323	33,569	297	12,335	287	3,753
Cases disposed of—												
1. By being struck off owing to the demand having been remitted.	516	8,512	2,840	16,054	1,425	4,236	685	1,943	90	4,461	80	296
2. By being wholly satisfied	2,879	46,398	4,400	35,433	1,457	2,406	1,713	4,773	116	877	95	461
Total	3,395	54,910	7,240	51,487	2,882	6,642	2,400	6,716	206	5,338	175	757
Balance outstanding at the close of the year.	520	6,987	979	13,000	2,292	20,615	2,923	26,853	91	6,997	112	2,996

From the above it will be seen that inclusive of 5,179 cases pending at the commencement of the year, there were 9,395 for disposal, covering a sum of Rs. 94,207. In 2,031 cases for Rs. 14,200 the demand was remitted, whilst in 4,422 for Rs. 46,910 the demand was fully satisfied. The number of cases pending at the close of the year was 2,912, the sum outstanding being Rs. 33,097. The Collector of Shahabad observes that remissions were mostly due to the cases covering bad and irrecoverable debts, and draws attention to the satisfactory decrease, compared with the preceding year, in the number of cases pending at its close. The excessive percentage of cases struck off in the Patna district is probably not unconnected with the delay in making collections, commented on in paragraph 65 of this note.

NAVIGATION RECEIPTS.

77. The tables below show the navigation revenue and tollage receipts for the last five years:—

NAVIGATION RECEIPTS.

YEAR.	EASTERN MAIN SERIES.			WESTERN MAIN SERIES.			Total.	Total tollage only.
	Number of miles open.	Tollage receipts.	Transport service receipts.	Number of miles open.	Tollage receipts.	Transport service receipts.		
	No.	Rs.	Rs.	No.	Rs.	Rs.		
1884-85	264	23,035	1,304	122	14,286	13,122	37,321	37,321
1885-86	264	19,579	—	122	22,128	4,531	41,719	41,719
1886-87	264	22,549	84*	122	27,159	4,536*	49,936	49,936
1887-88	264	27,612	95*	122	31,301	4,825*	53,508	53,508
1888-89	264	24,878	96*	122	27,296	5,007*	52,171	52,171

* There is no longer any Government transport service. These receipts are on account of hire of steamers, boats, and sundries.

TOLLAGE (ASSESSED).

YEAR.	Patna Canal System - Eastern Main Canal Series.	Arrah Canal System.	Buxar Canal System.	Total.
	Rs.	Rs.	Rs.	Rs.
1884-85	23,142	10,316	3,937	37,395
1885-86	19,523	14,808	7,388	41,719
1886-87	22,646	18,289	9,001	49,936
1887-88	28,206	15,306	8,030	51,542
1888-89	25,165	18,421	8,526	52,112

78.

COMPARISON OF TRAFFIC.

TRAFFIC.

		1888-89.	1887-88.	1886-87.	1885-86.	1884-85.
Number of miles open ...	No.	218½	218½	218½	218½	218½
Toll collections ...	Rs.	52,412	51,542	49,536	41,719	37,595
Rate of toll per mile ...	"	240	236	229	191	171
Boats, including empties ...	No.	8,096	8,116	8,573	7,210	6,434
Tonnage of boats ...	Tons	101,788	95,082	104,835	77,006	61,744
Estimated value of cargo, including rafts ...	Rs.	58,04,029	56,80,508	64,65,651	36,41,863	41,10,598

The decrease in the tollage levied on the Patna canal system, which is wholly under the head Tollage on rafts, is more than covered by increased tollage assessed during the year in the other canal systems. The decreased tollage on rafts is stated to be due to the stock of bamboos at Patna being in excess of the demand. The remaining variations do not appear to call for remark.

79. The expenditure on navigation establishment was Rs 13,071, against Rs 13,212 in the previous year

NAVIGATION ESTABLISHMENT.

80. There is no Government Steam Transport Service on the Sone canals, but three steamers, the property of Government, are hired to a contractor, who maintains a weekly service on the Patna canal, and a bi-weekly service on the Arrah and Buxar canals. The services are regularly maintained, and are understood to be popular, though the speed, owing to various considerations, is slow, barely averaging, including stoppages, four miles an hour.

TRANSPORT SERVICE.

81. The miscellaneous receipts for the last five years are given in the following statement:—

MISCELLANEOUS RECEIPTS.

		1888-89.	1887-88.	1886-87.	1885-86.	1884-85.
		Rs.	Rs.	Rs.	Rs.	Rs.
Sale of water ...		387	370	702	1,742	582
Plantations ...		383	394	319	307	178
Other canal produce ...		1,816	2,145	2,904	2,424	1,389
Water power ...		835	708	668	469	488
Rent of buildings ...		8,247	7,197	7,198	7,213	6,409
Fines ...		224	317	169	653	734
Miscellaneous ...	Rent of lands ...	7,995	10,997	15,231	14,369	13,770
	Fisheries ...	734	502	565	421	732
	Cost of process ...	3,739	2,474	6,302	6,414	7,066
	Sale of old materials ...	102	60	443	355	405
	Other items ...	2,042	3,295	3,213	3,713	8,651
Total ...		26,504	28,459	37,714	38,080	40,354

The only considerable decrease has been under the head rent of lands. It was last year explained that it had been found necessary to retain possession of land likely to be required for repair purposes owing to difficulties experienced in reclaiming it when required.

82. The state of the plantations in each division at the close of the years 1887-88 and 1888-89 is shown in the following statement:—

PLANTATIONS.

DIVISION.	1888-89.				1887-88.				Increase.	Decrease.
	Trees over 12 feet in height.	Saplings between 4 and 12 feet.	Seedlings under 4 feet.	Total.	Trees over 12 feet in height.	Saplings between 4 and 12 feet.	Seedlings under 4 feet.	Total.		
	No.	No.	No.	No.	No.	No.	No.	No.		
Eastern Sone ...	71,478	80,308	13,530	155,376	64,280	28,334	80,440	152,654	2,322	...
Arrah ...	35,871	33,979	61,018	120,868	31,503	15,274	54,944	101,021	19,247	...
Buxar ...	13,438	6,972	25,306	45,716	9,603	14,765	18,327	42,783	931	...
Total ...	120,787	121,259	199,854	319,900	105,386	58,373	153,611	296,860	73,500	...

The expenditure on plantations was Rs. 8,929, and the receipts Rs. 383, against Rs. 8,300 and Rs. 394, the respective amounts in the previous year. The plantations have not yet arrived at a stage in which any substantial sums

can be expected to be received as earnings, but there is a satisfactory progressive increase in the number of trees which require little or no outlay in keeping up.

FINANCIAL
RESULTS.

83. The receipts on revenue account and working expenses of the Sone Canals for the year 1888-89 and the nine preceding years are shown in the statement below:—

	1888-89.	1887-88.	1886-87.	1885-86.	1884-85.	1883-84.	1882-83.	1881-82.	1880-81.	1879-80.
<i>Receipts.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>	<i>Rs.</i>
Water-rates ...	7,39,886	5,19,886	8,90,461	9,79,323	7,70,329	4,94,209	2,60,483	6,03,080	2,79,296	4,44,716
Navigation ...	57,829	55,904	54,354	44,243	61,761	85,193	71,808	98,116	61,140	29,859
Miscellaneous ...	20,504	25,459	27,714	38,080	40,354	34,405	47,007	29,246	29,333	47,013
Total ...	8,18,219	6,03,949	9,16,429	10,62,646	8,63,474	6,13,807	6,64,677	7,30,299	6,78,644	5,31,589
Less refunds of revenue	12,611	10,331	15,737	10,657	7,455	5,429	1,237	1,389	1,637	1,945
Net total receipts ...	8,31,278	5,88,618	9,02,692	10,51,989	8,56,019	5,98,378	6,83,440	7,34,908	4,77,007	5,29,644
<i>WORKING EXPEN- SES.</i>										
<i>DIRECT CHARGES.</i>										
<i>I.—Works, Maintenance and Repairs.</i>										
Works (extensions and improvements).	10,426	5,593	...	...	...	...	...	...	...	...
Repairs, including com- pensation.	2,28,182	2,66,448	2,68,765	2,83,316	2,44,856	2,76,335	3,17,901	2,60,861	2,85,949	1,91,890
Establishment, including direction and accounts.	1,97,677	2,10,227	71,066	66,163	79,390	63,477	73,042	63,943	71,610	41,920
Tools and plant ...	33,999	28,221	27,698	32,451	26,175	34,983	11,898	8,194	880	4,500
Total ...	2,70,205	2,92,426	2,97,529	3,80,929	4,50,513	3,74,795	4,02,941	3,28,033	2,57,539	1,38,310
<i>II.—Revenue Manage- ment.</i>										
Irrigation establishment	1,88,349	1,36,243	1,43,660	1,46,028	1,29,308	1,14,008	1,05,893	1,14,253	1,02,476	1,06,534
Navigation establishment	14,165	14,398	14,535	14,756	16,885	29,248	19,890	13,678	10,618	10,483
Total ...	1,72,414	1,49,641	1,58,195	1,60,784	1,46,193	1,34,253	1,25,783	1,27,931	1,13,094	1,17,017
Total direct charges ...	7,42,619	7,01,979	6,65,724	5,41,713	5,96,506	5,09,048	5,28,724	4,55,963	4,70,633	2,55,327
<i>Indirect charges.*</i>										
Capitalization of abate- ment of land revenue, leave and pension allow- ances.	51,513	50,369	22,097	31,632	31,589	27,692	19,933	22,871	31,638	27,226
Total indirect charges ...	51,513	50,369	22,097	31,632	31,589	27,692	19,933	22,871	31,638	27,226
Total working expenses ...	7,94,432	7,52,348	5,97,821	5,73,345	6,28,095	5,36,740	5,48,657	4,78,834	5,02,271	3,82,553
Net revenue ...	26,546	(—)1,63,730	3,04,871	4,78,644	2,27,944	61,644	1,34,783	2,46,060	(—)25,264	1,47,091

* These are now shown under the suggestion of the Government of India.

Compared with 1887-88, the net revenue is Rs. 36,846 against a deficit of Rs. 1,63,730, which is mainly due to the increase in the total receipts from Rs. 5,88,618 to Rs. 8,31,278.

The working expenses during the year have exceeded those incurred in any year up to date, and, considering the small revenue derived from the canals, it is essential that any increase under this head shall be jealously watched.

In respect to the area irrigated, the year has been compared with 1884-85, and on referring to the table above it will be seen that the working expenses were Rs. 6,28,075 in that year, against Rs. 7,94,432 in 1888-89, showing an increase of Rs. 1,66,357, out of which Rs. 118,377 is in one item—"Establishment employed on maintenance, including direction and accounts." This increase in cost is apparent only. In 1884-85 a charge of 23 per cent. on the expenditure incurred on maintenance and repairs was made the balance being debited to the provincial establishment Roads and Buildings Branch, whilst at present the actual cost of the establishment employed, which is less than that actually engaged on the same work in the former year, is debited to this head. The new method of charging establishment has in fact added upwards of Rs. 1,10,000 to the permanent yearly working expenses of the Sone canals.

In 1888-89, Rs. 10,426 was expended on Extensions and Improvements, whilst in 1884-85 there was no expenditure under that head.

Under the head Maintenance, the expenditure in 1884-85 was Rs. 16,656 in excess of that incurred during the current year.

The expenditure on Tools and Plant was in excess in 1888-89 by the sum of Rs. 7,745, chiefly owing to the increased number of dredgers and mud punts now in use.

Under the head Revenue Management irrigation establishment there is an excess of Rs. 28,941 in 1888-89 wholly on the item headmen's fees. The actual expenditure on irrigation establishment was Rs. 1,07,411 in 1884-85 and Rs. 85,371 in 1888-89.

There was a reduction of Rs. 2,720, compared with 1884-85, under the head Navigation establishment.

Setting aside former years, there was special expenditure in 1888-89 on the following items:—

- I.—Substituting masonry arches in place of wooden platforms in the case of 14 bridges over the Chowra and Gurra Chowbey Canals.
- II.—Rebuilding the piers of the river sluices on the Dehree side of the Sone weir. On this work Rs. 50,024 were expended during the year.
- III.—The payment of one year's arrears of headmen's fees, amounting to Rs. 10,949, for 1886-87 in the Arrah Division.

In future years, now that the whole of the piers of the river sluices of the Sone weir have been reconstructed, the expenditure on works (extensions and improvements and maintenance) should be kept within Rs. 3,00,000, and there ought also, compared with 1888-89, to be a reduction of Rs. 10,000 in the item headmen's fees.

84. The cost of repairs to head-works during the last five years is shown below:—

	1888-89.	1887-88.	1886-87.	1885-86.	1884-85.
	Rs.	Rs.	Rs.	Rs.	Rs.
Sone weir	63,245	47,160	68,570	34,908	29,922
Other works	10,097	12,997	10,419	7,697	9,462
Total	73,342	60,147	78,989	42,605	39,384

The extra cost of maintaining the head-works was wholly due to special expenditure, amounting to Rs. 50,024, on the remodelling of the Dehree river sluices of the Sone weir. Work on rebuilding the piers was commenced in December, and the whole of the masonry work completed by the 31st March; the gates and fittings were finished before the present rains; the total expenditure on the new piers was Rs. 56,826. The whole of the piers of the river sluices of the Sone weir have now been rebuilt. Excluding special repairs to the river sluices, the expenditure on the head-works was Rs. 23,318 in 1888-89, against Rs. 25,139 in 1887-88.

85. The outlay on main canals and distributaries in each division during the last two years is shown below:—

	ARRAH DIVISION.		BUXAR DIVISION.		EASTERN SONE DIVISION.	
	1888-89.	1887-88.	1888-89.	1887-88.	1888-89.	1887-88.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Western Main canal	44,298	42,388	20,109	10,456	...	...
Eastern ditto ... ..	...	...	...	...	22,722	30,672
Canals	34,443	25,717	10,766	11,686	23,015	26,395
Branch canals	14,654	16,874	14,206	12,710	...	...
Distributaries	29,463	27,136	15,172	12,604	17,216	19,806
Drainage and protective works	2,358	3,044	153	388	2,763	2,944
Total	1,25,111	1,15,169	60,406	47,841	65,706	79,817

These figures are taken from the Superintending Engineer's report. The cost of maintenance, excluding head-works and telegraph lines, is Rs. 2,51,223, against Rs. 2,42,820 shown last year.

Both in the Arrah and Buxar Divisions the expenditure during the year was more than that of the year 1887-88. The increase is mainly due to special silt clearing in the 9th to the 13th miles of the Main Western canal and in miles 28 to 58 of the Arrah canal which had not been carried out for many years. The renewal of the Pakri bungalow roof with iron beams has also contributed

SILT CLEARING
AND DREDGING.

somewhat towards the excess expenditure. The outlay in the Eastern Sone Division was Rs. 14,111 less than in the year preceding.

86. The quantity of silt dredged from the Eastern and Western Main canals, and the rate at which the work was done during the last two years, are given below:—

CANALS.	1888-89.			1887-88.		
	Cubic feet dredged.	Cost, including removal over spoil bank or discharge into river.	Rate per 1,000 cubic feet.	Cubic feet dredged.	Cost, including removal over spoil bank or discharge into river.	Rate per 1,000 cubic feet.
		Rs.	Rs. A. P.		Rs.	Rs. A. P.
Eastern Main and Patna	23,27,518	12,944	5 9 0	30,66,938	17,521	5 11 6
Western Main ...	75,44,478	49,724	6 9 5	77,69,065	46,049	5 14 10

The Superintending Engineer makes the following observations in the increase in rate per 1,000 cubic feet in the case of the Western Main canal, and on the charge for interest and depreciation adverted to in last year's report:—

The rates compare unfavourably with those of the previous year, when for the most important item, Main Western canal, the rate was Rs. 5-14-10 per 1,000 cubic feet of silt dredged. This is in part due to liabilities for 1887-88, amounting to Rs. 2,209,* having been paid in 1888-89. Deducting this amount from the whole expenditure for 1888-89 and adding it on to that of 1887-88, the rates for the Main Western canal become Rs. 6-5-4 per 1,000 cubic feet for 1888-89 and Rs. 6-2-11 for 1887-88. The rate for 1886-87 was Rs. 7-6-6 per 1,000 cubic feet. It may be added that during 1888-89 the work was spread over 13 miles instead of being confined to the first 9 miles of the canal as usual.

Turning to the cost of dredging only, leather belting and rope cost Rs. 3,693 in 1888-89 and Rs. 1,313 in 1887-88. The extra cost during the year was partly owing to silt having been to a greater extent than usual thrown into the river requiring an extra length of rope, and partly to the month in which the ropes and belting were renewed falling in 1888-89. The extra rate owing to this cause in the Main Western canal is annas 4-4 per 1,000 cubic feet. Amongst other causes for the extra cost was Rs. 400 charged during the year for making a road through the spoil bank to the river.

The expenditure on repairs to dredgers was as follows:—

	Rs.
Fouracres' dredgers (12) ...	7,704
Bruce's " (2) ...	754
English " (2) ...	4,300
Mud punts (64) ...	2,870

If the total cost of dredging is required, the following sums, details regarding which are given in the Revenue Report for 1886-87, should be added to the rates mentioned above:—

	C. ft.	Rs. A. P.
For Fouracres' dredgers per 1,000	2 12 8
" Bruce's " " 1,000	4 14 4
" English " " 1,000	8 13 3
" Mud punts " " 1,000	2 14 1

The dredgers are laid up during part of the year, but this will have no effect on the charge for interest and depreciation, as the number of dredgers and punts cannot be diminished, every dredger and mud punt at times during the rains barely sufficing to keep the canal open, and it is a question whether the dredgers do not suffer nearly as much when laid up as when at work: it is the difference between rubbing and rusting. In any case the interest would be the same, as the dredgers cannot be employed on other work. The dredging accounts are perhaps not in such detail as might be desired, but further minute accuracy would involve increased clerical establishment. Instructions will be given that in future liabilities and not payments only during the year are to be taken into account.

In future reports the actual cost based on liabilities should certainly be shown, and it would be well to show the number of days during which the dredgers have been employed and been laid up.

The quantity and cost of silt clearances by hand in the Eastern Main and Patna canals during the last two years is shown in the following table:—

	1888-89.			1887-88.		
	Cubic feet cleared by hand.	Cost.	Rate.	Cubic feet cleared by hand.	Cost.	Rate.
		Rs.	Rs. A. P.		Rs.	Rs. A. P.
Eastern Main and Patna canals ...	27,78,008	10,642	8 13 9	1,981,168	9,081	4 18 6

In the case of the Western Main canal, in addition to the charge for dredging, Rs. 3,460 was spent in the Arrah Division and Rs. 258 in the Buxar Division on silt clearing by hand.

In the Arrah canal silt clearing on a more extensive scale than usual was carried out during the year, the quantity removed by hand being 28½ lakhs cubic feet at a cost of Rs. 8,282, and Rs. 1,444 was also expended on dredging silt accumulated in front of locks.

The expenditure incurred during the year on dredging and clearing silt in the branch canals and distributaries is shown below:—

Eastern Sone Division.

Distributaries, Patna Canal System ...	Rs. 1,359
--	-----------

Arrah Division.

Doomraon branch canal ...	938
Behea branch canal ...	88
Distributaries ...	4,934
Drainage and protective works ...	813

Buxar Division.

Buxar canal ...	453
Chowra branch canal ...	56
Distributaries ...	479

87. The cost of weed-clearing for the last five years is shown in the following table:—

			1888-89.	1887-88.	1886-87.	1885-86.	1884-85.
			Rs.	Rs.	Rs.	Rs.	Rs.
Eastern Sone Division ...	...	...	217	558	314	2,115	1,589
Arrah Division ...	...	...	1,725	3,343	2,218	2,491	3,976
Buxar ..	...	...	869	1,015	2,065	77	...
Total ...	...	...	2,811	4,915	4,597	4,683	5,565

It will be seen from above table that the cost of weed clearing during the year was about half of that incurred during preceding year.

This decrease in expenditure is attributed partly to the heavy discharge of the canals in October, which had apparently some effect in retarding the growth of the weeds, and partly to the silt clearance in the lower part of the Arrah canal previous to the rains which, for the time being, destroyed nearly all the weeds there. In the previous year the weeds in these miles had been very troublesome.

88. The mileage rates of cost of repairs are worked out below both for canals and distributaries, and compared with the rates of the two previous years in the statement below:—

CANAL.	Division.	1888-89.		1887-88.		1886-87.	
		Number of miles.	Cost per mile.	Number of miles.	Cost per mile.	Number of miles.	Cost per mile.
Eastern Main Canal ...	Eastern Sone ...	7½	8,124	7½	4,250	7½	2,345
Western ditto ...	Arrah ...	5	5,800	5	5,477	5	7,380
Buxar Canal ...	Buxar ...	16½	1,318	16½	633	16½	540
Patna do. ...	Do. ...	45½	338	45½	233	45½	406
Arrah do. ...	Eastern Sone ...	70	321	70	334	70	305
Doomraon Branch ...	Arrah ...	45½	327	45½	393	45½	455
Behea ditto ...	Do. ...	49½	187	49½	243	49½	158
Chowra ditto ...	Buxar ...	31	226	31	220	31	182
Gurra Chowbey Branch ...	Do. ...	39½	240	39½	195	39½	200
Distributaries ...	Do. ...	38	119	38	131	38	131
	Arrah ...	467½	65	467½	68	467½	54
	Buxar ...	24½	44	24½	37	24½	53
	Eastern Sone ...	258	48	258	55	257	46

The increase in the mileage rates, where such occur, is wholly due to the larger quantity of silt removed, which is itself a consequence of the larger area irrigated during the last two years.

89. The Western Main series of canals were closed from the 1st to the 12th June 1888, the Eastern Main series from the 17th April to the 25th May 1888, and the Arrah canal from the 28th mile downwards from the 2nd May to the 12th June 1888.

90. There were high floods during the year both in the river Sone and in the river Ganges. Little or no damage, however, was caused to the canal works. The highest readings on the gauges are noted below :—

RIVER SONE.

LOCALITY.	1888-89—17TH AUGUST 1888.		1887-88—15TH JULY 1887.		HIGHEST KNOWN, 1876-77—7TH JULY 1876.	
	Above weir.	Below weir.	Above weir.	Below weir.	Above weir.	Below weir.
Dehree	340.50	339.50	338.40	337.40	342.10	341.00
Baroon	342.60	340.40	340.13	338.10	343.50	342.70

RIVER GANGES.

LOCALITY.	Date.	Reading.	HIGHEST KNOWN SINCE 1874.	
			Date.	Reading.
Buxar	20th September 1888.	119.21	6th September 1875...	200.71
Deegah	19th	168.53	14th August 1879...	169.20
Hajipore, confluence of rivers Ganges and Gunduck.	19th	165.60	August	166.20

The Dehree canal head sluices were closed for 58½ hours and the Baroon canal head sluices for 136 hours during floods to avoid the influx of water heavily charged with silt.

CALCUTTA AND EASTERN CANALS.

91. The Capital and Revenue Accounts of these canals are given below :—

1.—CAPITAL ACCOUNT.

HEADS OF ACCOUNT.			Outlay during 1888-89.	Outlay to end of 1888-89.
DIRECT CHARGES.			Rs.	Rs.
Old outlay prior to the year 1861-62	...	...	.....	24,91,012
I.—Works	...	...	40,448	20,36,313
II.—Establishment	...	...	10,765	3,85,196
III.—Tools and plant	...	...	229	3,46,816
IV.—Profit and loss	...	...	.....	847
V.—Suspense accounts	...	...	(-) 3,580	10,797
Total	...	...	47,862	52,68,981
Less receipts on Capital account	...	...	.....	41,553
Net total direct charges	...	...	47,862	52,27,428
INDIRECT CHARGES.				
Leave and pension allowances	...	...	1,507	61,057

2.—REVENUE ACCOUNT—(ACTUALS).

REVENUE
ACCOUNT.

	EXPENDITURE.			RECEIPTS.	
	During 1888-89.	To end of 1888-89.		During 1888-89.	To end of 1888-89.
DIRECT CHARGES.	Rs.	Rs.		Rs.	Rs.
<i>I.—Works, Maintenance and Repairs.</i>					
Old outlay prior to the year 1861-62 ...	...	13,83,615	Old revenue prior to the year 1861-62 ...	...	80,17,101
Works (extensions and improvements) ...	4,573	9,01,017	Navigation ...	5,69,920	1,18,16,300
Repairs ...	1,63,656	29,72,469	Miscellaneous ...	5,224	4,17,028
Establishment, including direction and accounts... ..	46,981	10,23,917	Total ...	5,75,144	2,02,50,429
Tools and plant ...	29,054	90,759	Less refunds of revenue ...	19	19
Total ...	2,44,264	63,51,777			
<i>II.—Revenue Management.</i>					
Navigation establishment ...	37,684	11,61,263			
Total direct charges ...	2,81,948	75,13,040			
INDIRECT CHARGES.*					
Capitalized abatement of land revenue ...	...	...	
Leave and pension allowances ...	11,852	1,90,064			
Total direct charges ...	11,852	1,90,064			
Total working expenses... ..	2,93,801	77,03,104			
Profit ...	2,81,324	1,25,47,306			
Total ...	5,75,125	2,02,50,410	Net total receipts ...	5,75,125	2,02,50,410

* These are now shown under the suggestion of the Government of India

92. The following statement shows the financial results of these canals for the last ten years. The figures are both for direct and indirect charges :—

FINANCIAL
RESULTS.

YEAR.	CAPITAL OUTLAY		RECEIPTS AND WORKING EXPENSES.			Percentage of net revenue to capital outlay to end of year.
	During the year.	To end of the year.	Gross revenue.	Charges (direct and indirect).	Net revenue.	
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1879-80 ...	3,00,000	35,40,493	3,44,565	1,03,949	1,51,616	4.2
1880-81 ...	6,20,000	43,10,831	4,14,145	2,19,623	1,94,522	4.0
1881-82 ...	6,59,000	47,74,480	4,92,407	3,33,231	1,59,176	3.1
1882-83 ...	3,31,351	50,95,000	5,44,194	3,26,897	2,17,297	4.6
1883-84 ...	1,65,534	52,51,534	5,64,101	3,35,031	2,29,070	6.3
1884-85 ...	9,013	52,60,547	(a) 5,69,726	3,91,514	1,78,212	5.9
1885-86 ...	(-)42,900	52,17,081	(b) 4,79,434	1,90,000	2,89,434	5.4
1886-87 ...	6,283	52,23,274	4,83,334	1,92,984	2,90,350	5.5
1887-88 ...	10,840	52,33,716	5,79,094	2,24,036	3,55,058	6.7
1888-89 ...	49,369	52,83,485	5,75,125	2,93,801	2,81,324	5.3

(a) is Rs. 35,185 larger than it should be by reason of error of amount.
 (b) is Rs. 23,185 smaller than ditto ditto ditto.

The expenditure on Capital account was larger than it has been of recent years, and amounted to Rs. 49,369. Of this sum, Rs. 27,745 was spent on two wrought-iron caissons, to be used for closing the large locks at Dhappa and Chitpore, when these are under repair, and Rs. 12,258 on buildings, of which the chief are the new Dhappa toll-house, an inspection bungalow at Busseerhaut on the Eastern canals boat route, and a godown at Bhangore for the storage of goods recovered from wrecks.

The gross revenue, though less than that of 1887-88, is greater than that of any other preceding year since 1879-80, while the net revenue, though better than that of the first six years of the decade, is worse than that of either of the

three immediately preceding years. The receipts and working expenses for the last ten years are shown in greater detail in the following statement:—

	1885-86.	1887-88.	1888-89.	1889-90.	1890-91.	1891-92.	1892-93.	1893-94.	1894-95.	1895-96.
RECEIPTS.										
Navigation ..	Rs. 4,00,092	Rs. 5,74,760	Rs. 4,77,100	Rs. 6,01,141	Rs. 5,20,105	Rs. 5,51,715	Rs. 5,55,105	Rs. 4,77,086	Rs. 4,02,487	Rs. 5,31,050
Miscellaneous ..	2,532	5,189	6,153	121,037	49,931	12,488	9,091	9,781	11,711	12,581
Total ..	4,02,624	5,79,949	4,83,253	6,13,178	5,70,036	5,64,203	5,64,196	4,86,867	4,14,198	5,43,631
Less refunds of revenue ..	19	...	...	...	...	...	...	...	...	...
Net total receipts ..	4,02,605	5,79,930	4,83,234	6,13,178	5,70,036	5,64,203	5,64,196	4,86,867	4,14,198	5,43,631
WORKING EXPENSES.										
<i>Direct charges.</i>										
Works (extensions and improvements) ..	4,573	1,474	3,002	51,377	78,373	37,397	...	...	...	...
Maintenance and repairs ..	1,63,656	1,64,527	1,02,480	67,042	60,332	1,09,310	2,37,678	2,63,518	1,13,041	1,60,086
Establishment ..	81,605	88,168	60,880	47,844	38,013	61,674	12,547	64,030	80,663	61,790
Tools and plant ..	20,054	18,139	8,745	18,914	7,482	8,953	...	...	...	...
Total direct charges ..	2,10,288	2,12,308	1,72,307	1,86,177	2,75,192	2,89,054	3,20,255	3,27,251	2,15,501	2,83,776
<i>Indirect charges.*</i>										
Capitalization of abatement of land revenue, leave and pension allowances ..	11,953	11,344	9,376	9,402	13,022	11,407	6,032	4,967	3,722	4,171
Total indirect charges ..	11,953	11,344	9,376	9,402	13,022	11,407	6,032	4,967	3,722	4,171
Total working expenses ..	2,22,241	2,23,652	1,81,683	1,95,579	2,88,214	2,99,661	3,26,287	3,32,218	2,19,223	2,87,947
Net revenue ..	1,80,364	3,56,278	3,01,551	4,17,600	2,81,822	2,64,542	2,37,911	1,54,649	1,94,975	2,55,684

* These are now shown under the suggestion of the Government of India.

COLLECTIONS.

93. As compared with 1887-88, the navigation receipts show a falling off of Rs. 5,174, or 0.9 per cent., corresponding to a decline of 622, or 0.4 per cent., in the number of boats which paid toll. Miscellaneous revenue has increased by Rs. 384. The fluctuations in receipts from each source are shown below:—

CANALS.	Number of boats and rafts.	COLLECTIONS BY COLLECTOR AND SUPERVISOR.						COLLECTIONS BY EXECUTIVE ENGINEER.		Grand Total, Gross Revenue.
		Tolls from boats and rafts.	Demurrage.	Perry tolls.	Tolls from vessels and rafts.	Rents of buildings, lands and other miscellaneous receipts.	Total.	Rents of buildings, lands and other miscellaneous receipts.	Total.	
	No.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	
Calcutta and Eastern	90,000	4,22,869	4,740	3,500	6,670	3,274	4,30,071	1,780	4,31,851	871,922
Tolly's Nullah	73,819	1,39,292	912	867	...	...	1,54,200	...	...	293,492
Total, 1888-89 ..	163,819	5,62,161	5,652	4,367	6,670	3,274	5,84,271	1,780	5,86,051	1,168,414
Total, 1887-88 ..	169,031	5,62,405	6,022	2,854	6,645	3,591	5,78,238	1,680	5,79,918	1,148,153

BOATS.

94. On the Circular and Eastern Canals, which is the chief outlet to the Eastern boat-route, the number of boats rose from 58,959 to 90,068:—

		NUMBER AND CLASS OF BOATS.					
		Up to 100 maunds.	Between 100 and 200 maunds.	Between 200 and 300 maunds.	Between 300 and 400 maunds.	Over 400 maunds.	Total.
Circular and Eastern Canals	1888-89 ...	36,876	31,020	20,402	2,100	72	88,068
	1887-88 ...	34,968	30,806	21,227	1,800	69	88,959

The tolls collected on this route also show an increase of Rs. 1,874. On Tolly's Nullah, however, the number of boats is less by 1,819, and the takings by Rs. 8,193:—

		NUMBER AND CLASS OF BOATS.					
		Up to 100 maunds.	Between 100 and 200 maunds.	Between 200 and 300 maunds.	Between 300 and 400 maunds.	Over 400 maunds.	Total.
Tolly's Nullah	1888-89 ...	18,766	24,104	6,067	56	...	48,993
	1887-88 ...	18,244	24,793	7,202	69	...	50,308

The shallowness of the channel is the chief cause of the falling off. Besides the boats enumerated in these tables, the boats which are unclassified, being chiefly small boats of 100 maunds, paying toll at Russa on Tolly's

Nullah, numbered 29,127 against 29,641 in the previous year. Rafts show a decrease of 12 in number, and steamers and flats an increase of 45.

The traffic in rice was unfavourably affected by a disposition on the part of mahajans to lock up their stocks in view of a rise in price. On the other hand, the jute trade was brisk.

95. The following statement compares the traffic on the Calcutta canals and Tolly's Nullah during the year 1888-89 with the preceding year:—

TRAFFIC.

	Number of boats.	Tonnage of boats by canal measurement.	Weight of cargo carried.	Value of cargo carried.	Tollage, including demurrage.	Percentage of toll on value of cargo.
	No.	Tons.	Tons.	Rs.	Rs.	
1888-89 { Calcutta canals ...	90,068	2,006,703	701,543	5,44,07,258	4,30,288	
... Tolly's Nullah ...	78,120	799,375	230,450	1,02,07,751	1,30,203	
Total ...	168,188	2,806,078	931,993	7,10,70,009	5,60,491	6.79
1887-88 { Calcutta canal ...	89,859	2,005,067	690,728	4,78,97,746	4,50,417	
... Tolly's Nullah ...	79,950	914,939	259,776	1,50,64,767	1,81,455	
Total ...	169,809	2,920,006	950,504	6,29,62,513	6,31,872	6.70

There is decrease in all heads except in value of cargo, which shows an increase of Rs. 75,13,036, attributable to the higher prices of goods.

96. In the number of missing tickets there is a very satisfactory decrease of 348, or about 51 per cent.

MISSING TICKETS.

97. The disposal of the revenue derived from the rents of surplus lands on these canals has recently been the subject of some discussion, and may be briefly referred to here. The income from this source aggregates about Rs 38,000, of which Rs. 28,000 has always been collected by the Collector of the district, while the collection of the remaining Rs. 10,000, which was formerly in the hands of the canal officers, was, in consequence of the recommendations of the Committee appointed in 1886, also transferred to the Collector. It has been decided by the Government of India, in the Finance Department, that, as the whole of this income is now collected by the Collector, it should be credited under the head of "Land Revenue," and, as a consequence of this decision, the further question has arisen of the propriety of making a reduction in the amount shown as capital expenditure in the accounts. It is true that the importance of this question is lessened by the fact that no interest is paid on capital in the case of these canals; but the financial position of any work cannot be said to be accurately stated so long as capital is debited with expenditure, the profits of which do not appear in the revenue account; and, for this reason, the Officiating Chief Engineer has recorded his opinion that the reduction in the capital account should be made; and further, as the value of the lands has been enhanced by the successful development of the canals, that the sum so credited to the capital account should be the present value of the lands, and not their original cost.

RENTS OF SUR-PLUS LANDS.

98. The statement below compares the entire cost of the Revenue establishment under the Collector and Supervisor with the gross collections made by him for the last four years:—

REVENUE ESTABLISHMENT.

	Gross collections made by Collector and Supervisor.	Cost of entire Revenue establishment.	Percentage.
	Rs.	Rs.	
1888-89	5,73,304	37,684	6.57
1887-88	5,78,288	38,920	6.73
1886-87	4,81,048	42,714	8.84
1885-86	5,13,839	44,751	8.70

Although the collections of the year were less than the amount of the previous year the Supervisor's commission was greater on account of the unusually heavy commission for March 1888 being paid in April. This was more than counterbalanced by the reduction under other heads on account of the transfer of an Inspector to the Nuddea Rivers and the pensioning of the head clerk, the places in both cases being taken by men on lower salaries.

Although there has been a small reduction in the number of boats entering the canals, yet the result of a further reduction in the cost of establishments is again a small decrease in the cost per boat measured from 3.68 to 3.58 annas.

99. The total number of boats wrecked owing to various causes during the year was 106, against 128 of the previous year.

100. From the statement already given in paragraph 86, it will be seen that the working expenses, including all charges, direct and indirect, have increased from Rs. 2,24,656 to Rs. 2,93,801, and that this increase has taken place mainly in the cost of maintenance and repairs, which has risen from Rs. 1,04,527 to Rs. 1,63,656. Under "Channels and Banks," on which the increase in the cost of maintenance is Rs. 39,158, is included the greater portion of the outlay on the Bhyrub and Assassooni khalls, two links in the chain of rivers, and tidal creeks forming the Eastern boat route, both of which were laid dry and the work carried out at the end of 1887-88, the silt being cleared by hand. The clearance of the Tetooa khall and some extensive piling work near Hastings on Tolly's Nullah were also charged under this sub-head. Under "Towpaths," on which the increase is Rs. 5,616, much of the repairs carried out in 1887-88 was paid for in 1888-89, while on "Rustic Bridges," on which only ordinary charges had been incurred for some years, the renewals now found necessary caused an increase of Rs. 8,671.

101. On "Dredging" the expenditure has increased from Rs. 4,254 to Rs. 10,979. 979,700 cubic feet of silt were dredged by two dredgers for Rs. 8,698; an average rate of Rs. 8.14 per thousand cubic feet. The quantity dredged in the previous year was 350,700 cubic feet, and the rate Rs. 9.8.4 per thousand.

ORISSA COAST CANAL.

102. The Capital and Revenue accounts of this canal are given below:—

1.—CAPITAL ACCOUNT.

HEADS OF ACCOUNT.		Outlay during 1888-89.	Outlay to end of 1888-89.
		Rs.	Rs.
DIRECT CHARGES.			
I.—Works ...	...	70,302	32,19,103
II.—Establishment ...	...	24,963	7,26,121
III.—Tools and plant ...	...	3,464	1,74,816
IV.—Suspense accounts ...	...	(—) 911	37,311
Total ...	...	97,818	41,57,351
V.—Less receipts on Capital account ...	...	7	3,278
Net total direct charges ...	...	97,811	41,54,073
INDIRECT CHARGES.			
Capitalized abatement of land revenue ...	...	.....	784
Leave and pension allowances ...	...	3,495	1,01,572
Total indirect charges ...	...	3,495	1,02,356

A revised estimate for this canal was sanctioned by the Secretary of State in August 1889, and amounted to Rs. 43,46,873 (direct charges), or Rs. 1,92,800 over the total expenditure to end of the year 1888-89. The canal has been open throughout its entire length of 97½ miles during the year. The works in progress under "Original works" comprised the finishing up of the canal banks, locks, and ferry ghâts, and the completion of the Panchpara supply pipe.

The canal is practically complete, though certain details, such as the provision of accommodation for the tolls establishment, ferry ghâts, &c., remain to be carried out. Some 2,900,000 cubic feet too of earth has still to be taken out of the bed, but as it offers no serious obstacle to navigation, and to dredge it would be expensive, its removal has been deferred.

The expenditure has been entirely from Provincial Funds with the exception of Rs. 8,66,000 contributed from Imperial Protective Funds. There is no interest account.

3—REVENUE ACCOUNT (ACTUALS).

REVENUE
ACCOUNT.

	EXPENDITURE.			RECEIPTS.	
	During 1888-89.	To end of 1888-89.		During 1888-89.	To end of 1888-89.
	Rs.	Rs.		Rs.	Rs.
DIRECT CHARGES.					
<i>I.—Maintenance and Repairs.</i>					
Maintenance and repairs	42,606	1,63,007	Navigation ...	65,047	1,60,088
Establishment, including direction and accounts	11,377	41,112	Miscellaneous ...	1,381	3,400
Tools and plant ...	14,462	27,428	Total ...	66,428	1,63,488
Total ...	68,445	2,31,547	<i>Less—Refunds of revenue ...</i>	<i>254</i>	<i>271</i>
<i>II.—Revenue Management.</i>			Net total receipts	66,174	1,63,217
Navigation Establishment ...	6,123	13,474	Deficit ...	10,844	89,446
Total direct charges ...	74,568	2,45,021			
INDIRECT CHARGES.*					
Capitalized abatement of land revenue ...	.....	.....	
Leave and pension allowances ...	2,450	7,642			
Total indirect charges ...	2,450	7,642			
Total working expenses	77,018	2,52,663	Total ...	77,018	2,52,663

* These are now shown under the suggestion of the Government of India

103. The receipts and working expenses of the Orissa Coast canal since the year 1885-86, when the Revenue account was first opened, are shown in the following statement:—

FINANCIAL
RESULTS.

	1888-89.	1887-88.	1886-87.	1885-86.
	Rs.	Rs.	Rs.	Rs.
RECEIPTS.				
Water-rates ...	...	...	(—)1	1
Navigation ...	65,010	52,828	28,587	13,663
Miscellaneous ...	1,418	1,026	902	54
Total ...	66,428	53,854	29,488	13,718
<i>Less refunds of revenue ...</i>	<i>254</i>	<i>17</i>	<i>...</i>	<i>...</i>
Net total receipts ...	66,174	53,837	29,488	13,718
WORKING EXPENSES.				
DIRECT CHARGES.				
<i>I.—Maintenance and Repairs.</i>				
Repairs ...	42,606	53,277	43,969	23,155
Establishment, including direction and accounts ...	11,377	14,289	10,120	5,326
Tools and plant ...	14,462	8,743	3,432	791
Total ...	68,445	76,309	57,521	29,272
<i>II.—Revenue Management.</i>				
Navigation establishment ...	6,123	4,559	2,183	609
Total direct charges ...	74,568	80,868	59,704	29,881
INDIRECT CHARGES.				
Capitalized abatement of land revenue ...	...	...	...	...
Leave and pension allowances ...	2,450	2,639	1,722	831
Total indirect charges ...	2,450	2,639	1,722	831
Total working expenses ...	77,018	83,507	61,426	30,712
Net revenue ...	(—)10,844	(—)29,670	(—)31,938	(—)16,994

RECEIPTS.

The increase in the navigation receipts is satisfactory. The Superintending Engineer, however, notices that out of Rs. 66,428, which were the toll-takings of the whole canal, no less than Rs. 45,275 were derived from Range III. The traffic still seems to be almost entirely local, and the only vessels which perform the through journey from Calcutta to Chandbally are the steamers of the Calcutta Steam Navigation Company. The question of encouraging through boat-traffic may now be considered, and it may be that a reduction of through tolls would result in an increase of revenue.

MAINTENANCE.

There is a decrease of Rs. 6,252 in the working expenses, including direct and indirect charges. The cost of repairs declined from Rs. 53,277 to Rs. 42,606, and the average cost per mile from Rs. 546 to Rs. 437. Some of the expenditure on repairing cyclone damages of previous years was incurred during the year under review. The expenditure on tools and plant was greater by Rs. 5,719. Heavy repairs to barges and steam-launches, and renewals of ferry boats were carried out.

TRANSPORT SER-
VICE.

104. The bi-weekly service of steamers maintained by two Calcutta companies between Calcutta and Cuttack attracted 27,747 passengers, chiefly pilgrims. The Executive Engineer states:—"No sufficient attention is paid by the companies to the service of such a town as Balasore on this route. The accommodation provided for pilgrims at stopping places is scanty and insufficient and detrimental to their health, and complaints of overcrowding were by no means few."

FLOODS.

105. The disastrous inundation of the country traversed by Range III of the Orissa Coast Canal, which followed the heavy rainfall of August 1888, has already been mentioned, in the remarks on the Hidgelee Canal. It is generally admitted that the silting of the main drainage outlets which causes these floods, is chiefly due to the excessive land reclamation which has taken place about the mouths of these channels, and to the construction of bunds across the channels after the flood season, according to custom from an early period. Certain modifications have been suggested, and some are being carried out, in the works of the Coast Canal, so that the canal shall assist in relieving the country as far as possible. The Superintending Engineer states that the works were not appreciably injured by the floods.

SARUN CANALS.

CAPITAL ACCOUNT.

106. The Capital and Revenue accounts of these canals are given below:—

1.—CAPITAL ACCOUNT.

HEADS OF ACCOUNT.				Outlay during 1888-89.	Outlay to end of 1888-89.
DIRECT CHARGES.				Rs.	Rs.
I—Works	4,79,946
II—Establishment	1,64,170
III—Tools and plant	25,612
Total				...	6,69,728
V—Less receipts on Capital account				...	498
Net total direct charges				...	6,69,230
INDIRECT CHARGES.					
Capitalized abatement of land revenue				...	97
Leave and pension allowances				...	27,086
Total indirect charges				...	27,183

2.—REVENUE ACCOUNT (ACTUALS).

REVENUE
ACCOUNT.

	EXPENDITURE			RECEIPTS	
	During 1888-89	To end of 1888-89.		During 1888-89	To end of 1888-89.
DIRECT CHARGES.	Rs.	Rs.		Rs.	Rs.
Maintenance and repairs	23,976	1,92,784	Water-rates ...	20,415	1,52,151
Establishment ...	10,248	53,911	Navigation ...	...	263
Tools and plant ...	673	(-)6,831	Miscellaneous ...	399	7,441
Total direct charges ...	34,897	2,39,864	Total ...	20,814	1,59,855
INDIRECT CHARGES.			Less refunds of revenue ...	...	...
Capitalized abatement of land revenue	...	...	
Levy and pension allowances	1,435	8,261	Net total receipts	20,814	1,59,855
Total indirect charges ...	1,435	8,261	Deficit ...	15,518	88,270
Total working expenses	36,332	2,48,125	Total ...	36,332	2,48,125

These are now shown under the suggestion of the Government of India.
No works chargeable to Capital Account were carried out during the year.

107. The receipts and working expenses of the Sarun canals since the year 1880-81, when the Revenue account was first opened, are shown in the following statement:—

FINANCIAL
RESULTS.

	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.
RECEIPTS.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Water-rates ...	9,269	8,583	16,208	22,017	8,397	39,737	11,072	21,070	20,415
Navigation ...	...	230	19	13	1	...	...	...	...
Miscellaneous ...	630	808	1,740	971	943	1,406	1,355	(-)400	399
Total ...	10,000	4,317	18,027	23,041	9,341	41,143	12,427	20,663	20,814
Less refunds of revenue	...	...	...	...	...	...	...	...	...
Net total receipts ...	10,000	4,317	18,027	23,041	9,341	41,143	12,427	20,663	20,814
WORKING EXPENSES.									
Direct charges.									
Maintenance and repairs	...	39,548	29,829	29,689	19,963	18,014	23,451	19,601	23,976
Establishment ...	...	8,783	9,560	4,781	4,690	4,144	5,460	9,119	20,548
Tools and plant ...	...	(-)2,786	(-)2,066	(-)2,000	371	593	(-)978	400	673
Total direct charges ...	...	44,345	37,363	32,461	24,920	22,751	27,933	29,120	34,897
Indirect charges.									
Capitalization of abatement of land revenue	...	...	...	...	...	...	...	...	...
Levy and pension allowances	...	1,559	1,846	865	843	890	280	1,377	1,435
Total indirect charges ...	...	1,559	1,846	865	843	890	280	1,377	1,435
Total working expenses ...	...	45,709	39,209	33,326	25,763	23,641	28,213	30,497	36,332
Net revenue ...	10,000	(-)11,483	(-)10,921	(-)10,285	(-)10,223	17,512	(-)10,233	(-)9,733	(-)15,518

The increased cost of repairs is due to extensive repairs to the protective works at Siswa, the head of the Main canal, and to the construction of a bund at Chuttahi just above the Gundaki feeder above the Rupan Chap sola, which is *de facto* the main canal, and which broke into the river Gunduck during the rains of 1888. This cut has, notwithstanding the efforts made to prevent it, further developed during the current year, and is certain to be a cause of much trouble and expense.

The cost of silt clearing was moderate, 1,092,134 cubic feet of silt having been removed at a cost of Rs. 3,684. against 1,489,000 cubic feet costing Rs. 5,452 in 1887-88.

IRRIGATION.

108. These canals were, as last year stated, primarily intended for the supply of water for the manufacture of indigo. The water available is to a certain extent used for irrigation, but the areas returned as irrigated are not reliable, there being no special establishment employed to assess water-rates, which are collected by the gentlemen who have guaranteed a revenue of Rs. 21,860. There are no distributaries and but few village channels, and the guarantors are understood to have considerable difficulty in assessing lands watered direct from the canals, which are in fact the old nullahs of the country.

There was a complete failure of the *Hutia* rain, and in consequence a demand for water for rice irrigation, and also to a limited extent for rabi irrigation, as seeds could not be sown in many places for want of moisture without artificial irrigation.

The areas irrigated for all years since 1881-82 are shown below:—

	Acres.
1881-82	866
1882-83	1,741
1883-84	21,122
1884-85	7,223
1885-86	4,565
1886-87	2,146
1887-88	4,218
1888-89	7,213

COLLECTIONS.

109. The amount of the guarantee is recovered by the Collector of Sarun. The assessments, remissions, and recoveries for the canals are shown below:—

	Ra.
Balance unrecovered on the 1st April 1888	24,321
Assessment of the year's guarantee	21,860
Miscellaneous revenue collected by Executive Engineer	399
Total	46,570
Remitted	Nil
Net demand	46,570
Recovered on account of guarantee by Collector	19,381
Guarantee paid by canal managers	4
Fisheries	20
Miscellaneous	83
Realized by guarantors for water-rates	924
Realized by Collector for water-rate under Certificate Act	20,415
Recovered by Executive Engineer	399
Total collections	20,814
Balance on 1st April 1889	25,756

The outstanding balance has increased slightly during the year.

PLANTATIONS.

110. The plantations are of but trifling extent. The number of trees in existence is shown in the table below:—

	1888-89.	1887-88.
	Ra.	Ra.
Trees over 12 feet in height	3,988	1,710
Saplings between 4 and 12 feet	1,751	694
Seedlings under 4 feet	3,693	1,915
Total	9,432	4,319

The expenditure on plantations up to the end of the year has amounted to Rs. 1,485.

FLOODS.

111. There were no floods during the year of any importance. The river Gunduck did not even reach the embankment; the highest flood was on 20th July 1888 when the gauge registered 240.50, which was 2.10 feet below the highest flood on record, viz., 242.60 in August 1883.

112. The guarantee expires on the 1st of April 1890. Preparations have been made to build a regulator at Hatpokur, but it will be necessary to determine what measures will be necessary to prevent the Rupan Chap *sota* forcing a passage into the river Gunduck at Chattahi before expending a considerable sum of money on a regulator below that place.

GENERAL.

NUDDEA RIVERS.

113. The channels comprising the Nuddea rivers system are situated in the districts of Moorshedabad and Nuddea. Their approximate lengths are as follows:—

Bhagiruthee	...	...	167 miles to Nuddea.
Bhyrub-Jellinghee	...	...	41 ditto.
Matabhanga	...	...	138 miles to outfall on the Hooghly.
Hooghly	...	...	31 miles from Nuddea to Chogda.
			477 miles.

The management of the revenue has passed from the hands of the Board of Revenue to the Public Works Department. A revenue account also has been opened for these rivers. Both changes were effected at the commencement of the year under report.

The Revenue Account is given below:—

REVENUE
ACCOUNT.

	EXPENDITURE			RECEIPTS	
	During 1888-89.	To end of 1888-89.		During 1888-89.	To end of 1888-89.
DIRECT CHARGES	Rs.	Rs.		Rs.	Rs.
I.— <i>Works, Maintenance and Repairs.</i>			Old revenue prior to the year 1870-71 ...	...	38,79,660
Old outlay prior to the year 1870-71 ...	...	23,95,857	Navigation ...	1,91,791	39,25,243
Works (extensions and improvements) ...	...	29,124	Miscellaneous ...	97	17,305
Repairs ...	88,933	9,00,167	Total ...	1,91,888	78,22,208
Establishment, including direction and accounts ...	20,389	3,51,049	<i>Less—Refunds of revenue</i> ...		...
Tools and plant ...	2,380	1,66,515			
Suspense accounts ...	(—)14	4,891	Net total receipts ...	1,91,888	78,22,208
Total ...	1,11,688	38,47,603			
II.—Revenue Management.					
Navigation Establishment ...	23,006	3,96,603			
Total direct charges ..	1,34,694	42,44,206			
INDIRECT CHARGES.*					
Capitalized abatement of land revenue ...	...	...	
Leave and pension allowances ...	6,075	2,21,813			
Total indirect charges	6,075	2,21,813			
Total working expenses	1,40,769	44,66,019			
Profit ...	51,119	38,56,189			
Total ...	1,91,888	78,22,208			

* These are now shown under the suggestion of the Government of India.

FINANCIAL
RESULTS.

114. The following statement shows the receipts and working expenses for the past ten years. The figures are for both direct and indirect charges :—

	1879-80.	1880-81.	1881-82.	1882-83.	1883-84.	1884-85.	1885-86.	1886-87.	1887-88.	1888-89.
Receipts.										
Navigation	Rs. 2,30,000	2,31,007	2,19,040	1,82,351	2,00,008	1,94,081	1,85,333	2,02,707	1,95,810	1,91,709
Miscellaneous	(-) 170	070	1,179	610	1,020	470	309	643	857	430
Total	2,30,627	2,32,077	2,11,219	1,83,067	2,02,834	1,94,551	1,85,642	2,03,350	1,96,667	1,92,139
Less refunds of revenue	...	...	...	...	...	...	...	...	...	...
Net total receipts	2,30,627	2,32,077	2,11,219	1,83,067	2,02,834	1,94,551	1,85,642	2,03,350	1,96,667	1,92,139
WORKING EXPENSES.										
Direct charges.										
Works (extensions and im-										
provements)	657	...	10,310	5,603	1,031	30	...	...	...	...
Maintenance and repairs ...	48,172	65,709	74,900	81,509	84,513	80,780	47,004	59,001	68,201	68,833
Establishment	39,075	55,004	63,320	82,010	40,350	34,798	31,543	32,700	41,913	43,300
Tools and plant	205	473	1,30,108	24,400	(-) 1,002	1,740	1,739	1,400	3,503	2,300
Suspense accounts	12,082	(-) 4,431	(-) 3,412	(-) 1,537	3,897	(-) 11,659	1,302	450	(-) 1,037	(-) 114
Total direct charges	1,00,291	1,17,415	2,67,938	1,10,074	1,25,273	95,776	73,008	90,213	93,823	1,34,694
Indirect charges.*										
Capitalized abatement of										
land revenue ... ..	...	...	...	...	...	...	...	...	...	...
Leave and pension allow-										
ances	5,400	7,793	7,465	4,607	5,647	4,967	4,419	4,101	5,870	6,073
Total indirect charges	5,400	7,793	7,465	4,607	5,647	4,967	4,419	4,101	5,870	6,073
Total working expenses	1,05,691	1,25,208	2,75,403	1,14,681	1,30,920	1,00,743	77,427	94,314	99,693	1,40,767
Net revenue	1,24,936	1,06,869	(-) 64,184	68,386	71,914	93,808	1,08,223	1,09,036	96,974	51,372

* These are now shown under the suggestion of the Government of India.

The receipts have decreased by Rs. 6,747. Toll-takings are less by Rs. 6,569, of which Rs. 4,400 is the decrease in tolls collected from steamers and flats, caused mainly by the withdrawal of the services of the India General Steam Navigation Company from the Bhagiruthee route—a loss which was only partly made up by the improvement in the steamer traffic on the Matabhanga. Two new services have been started by the Calcutta Steam Navigation Company—a weekly service from Calcutta to Akrigunge, and a daily service between Kulna, Nuddea, and Krishnagore.

It was found impossible to maintain the channel of the Bhagiruthee during the dry months on account of the silting up of the lower intake. The boat traffic was therefore diverted to the Bhyrub-Jellinghee, which was kept open throughout the year.

TRAFFIC.

115. The traffic during the year is shown in the following statement :—

NUDDEA RIVERS.	Number of boats inclusive of rafts.	Tonnage of boats.	Weight of cargo.	Value of cargo.	Tollage.	Percentage of toll on value of cargo.
	No.	Tons.	Tons.	Rs.	Rs.	%
Bhagiruthee	11,037	101,104	91,055	48,61,021	20,250	...
Butto, Jellinghee and Hooghly	34,425	417,001	174,207	2,00,27,314	20,208	...
Matabhanga	15,202	201,275	100,000	1,12,01,240	60,201	...
Total, 1888-89	60,664	719,380	365,262	3,00,89,575	1,00,659	0.33
Total, 1887-88	65,579	793,547	380,407	3,41,40,301	1,08,274	0.32

Thus the number of boats is less, while the tonnage is greater, than in the previous year. This is partly explained by the figures in the following table, which show that the decrease in numbers took place in the smaller classes of boats :—

NUDDEA RIVERS.	NUMBER OF BOATS.						COLLECTIONS BY TOLL COLLECTORS.					
	Up to 100 maunds.	Between 100 and 1,000 maunds.	Between 1,000 and 2,500 maunds.	Between 2,500 and 5,000 maunds.	Over 5,000 maunds.	Total.	Tolls from boats.	Tolls from steamers and flats.	Tolls from rafts.	Total tolls.	Miscellaneous revenue.	Total collections.
	No.	No.	No.	No.	No.	No.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Bhagiruthee	8,127	4,100	1,316	374	1	10,908	20,000	13	230	20,250	...	...
Butto, Jellinghee and Hooghly	20,474	11,500	1,074	14	...	34,062	92,420	2,104	855	95,379	...	...
Matabhanga	6,019	8,100	1,067	183	1	15,360	81,000	9,100	45	90,201	...	...
Total, 1888-89	31,620	23,700	3,457	571	2	66,360	1,70,540	11,267	830	1,81,637	159	1,81,796
Total, 1887-88	33,239	27,079	4,000	846	7	65,111	1,80,817	15,707	1,034	1,96,558	267	1,96,825

It is also stated that small boats under 25 maunds, which are not measured, were included in the returns of the previous year, but were not counted in the year under report.

It is observed that while the tonnage is greater, the toll-takings are less. This point has not been explained.

116. There has been a heavy increase in the cost of maintaining the channels, which has risen from Rs. 48,201 to Rs. 88,943, and is greater than it has been in any one of the last ten years. The heavy expenditure was mainly incurred in the endeavour to keep open the head of the Bhagiruthee after the termination of the rainy season. The works, which were more costly than those carried out in 1887-88, were again unsuccessful. They are described thus by the Executive Engineer:—

"In consequence of the lower entrance at Joyrampur having silted up, a channel was excavated in it for the purpose of admitting water at a cost of Rs. 11,599. The river also fell very rapidly in 1888-89, and training works were begun earlier and carried out to a greater extent than in the previous year; hence the extra outlay. It may be mentioned that a sum of Rs. 19,070 of the expenditure on the Bhagiruthee was due to work done in 1887-88, but not paid. On the other hand, the whole cost of the work actually done in 1888-89 could not be paid in that year, and Rs. 12,100 has been held over till the following year."

All this expenditure was in one sense thrown away, for the Jellinghee-Bhyrub remained open through the dry season, and offered an alternative route which was freely accepted by the traffic. The justification for it lies in the danger that the Jellinghee and Matabhanga routes may also fail at the same time as the Bhagiruthee—an event which would lead to a heavy loss of revenue. The Superintending Engineer also remarks that the question of maintaining the channel of the Bhagiruthee is now better understood, and it is hoped that it may be kept open during the ensuing dry season at less cost.

117. The increase in the cost of Revenue establishment from Rs. 22,176 to Rs. 23,006 was mainly caused by payment of leave allowances to one of the Toll Collectors who was absent on leave. The percentage of cost of collection to gross revenue has risen from 11.2 to 12.5, and the cost of measuring each boat from 5 annas 4 pie to nearly 6 annas.

The share of establishment charges allotted against the works in the Public Works Department has risen from Rs. 19,749 to Rs. 20,389.

In consequence mainly of the high maintenance charges, the net revenue is only Rs. 51,119—a smaller sum than any realised during the last ten years.

118. Abnormally high floods took place in the lower sections of the Bhagiruthee and Matabhanga rivers. In the former river the reading on the Berhampur gauge was the highest recorded having been 30'1½" against 29'9½" in 1886 although the gauge at the head of the river was 3.59" short of a maximum flood. This unusual height at Berhampur was probably caused by the swollen state of the Adja and Dwarka rivers which was in high floods and backed up the discharge of the Bhagirathi. The cause of the severity of the Matabhanga flood is not known. Such floods cause no damage to the training works, which are removed before the rivers rise.

EDEN CANAL.

119. This canal was primarily constructed as a sanitary work and for the supply of drinking water only. In October 1888, however, on the representations of the district officers regarding the extreme condition of the rice crop and the urgency of the cry for irrigation, it was decided to open the sluices and supply water at a rate of 4 annas per bigha. Ultimately the Collector succeeded in assessing 15,544 bighas at that rate—a result considerably below the anticipations formed, and it appears that the assessments of the area irrigated were strenuously contested.

No capital or revenue accounts are kept. The collections of water-rates amounted to Rs. 3,027, and the receipts from all sources (including water-rates) to Rs. 3,772. The expenditure on works and repairs was Rs. 25,413 against Rs. 29,126 in the previous year.

MADHUBAN CANAL.

120. This a small canal of which no capital or revenue accounts are kept. The special repairs to the weir mentioned in last year's report were completed early in the year, and the canal was opened for irrigation on the 15th August 1888. Water was continually running until the 31st January 1889, when 2½ inches of rain fell and stopped the demand for water. The area irrigated was 8,560 acres, including 3,830 acres of opium. The expenditure incurred on maintenance was Rs. 4,194 against Rs. 9,821 spent in the year previous, which, however, included Rs. 4,729 for special repairs against Rs. 582 required for this purpose in 1888-89.

GENERAL REMARKS.

NET REVENUE

121. The working of the canals classed as Major irrigation works in Bengal resulted in a net deficit of Rs. 23,721, as below:—

	Ra.
Gross direct receipts	13,94,369
Ditto charges	14,18,090
Deficit	23,721

The budget estimate of net revenue was (—) Rs. 42,000, and the revised estimate, which provided for an additional Rs. 26,000 in working expenses, was (—) Rs. 68,000.

In 1887-88 the revenue on the Sone canals had been seriously affected by the local agitation against the canal administration, and consequently the net result of the year on Major works had been a loss of Rs. 4,00,356. The budget estimate for 1888-89 was framed with the expectation that this adverse influence would gradually be brought to rest; and though many indications in the course of the year made it clear that this expectation was being fulfilled, and that the benefits of irrigation were being freely admitted by the users of water, still the state of the collections at the time the revised estimate was issued was not such as to justify any substantial advance on the figures of the original estimate. Ultimately the receipts exceeded the estimate by Rs. 36,369, while the working expenses were less by Rs. 7,910.

	Budget estimate.	Revised estimate.	Actuals.
	Ra.	Ra.	Ra.
Direct receipts	13,58,000	13,58,000	13,94,369
Do. charges	14,00,000	14,26,000	14,18,090
Net revenue	—42,000	—68,000	—23,721

EARNINGS.

122. The net income from Major works calculated on the earnings of the year is shown below—

	1888-89.
	Ra.
Orissa canals	(—)70,262
Midnapore canal	82,123
Hidgellie Tidal canal	(—)22,943
Sone canals	83,080
	71,978

The result shown in this statement is calculated on the actual navigation and miscellaneous receipts, as well as the whole amount of the water-rates assessable on crops raised by canal water supplied during the year. In the Revenue Reports of previous years, earnings have been calculated on the demand on which it was possible to make recoveries. In the present report the whole of the liability incurred, whether recoverable within the year or not, is taken as revenue earned, less actual refunds. This is in accordance with the instructions

of the Government of India, and is the same as the method followed in the Upper Provinces. On the expenditure side actual charges, direct and indirect, have been taken.

123. The approximate value of crops irrigated by Major irrigation works VALUE OF CROPS. during the last two years is shown below:—

CANALS.	1887-88.		1888-89.	
	Area irrigated.	Value of crops.	Area irrigated.	Value of crops.
	Acres.	Rs.	Acres.	Rs.
Orissa canals ...	109,506	19,06,362	159,292	51,64,168
Midnapore canal ...	65,864	13,17,280	69,777	17,44,425
Sone canals ...	315,380	76,89,808*	355,909	1,10,07,607
Total ...	490,750	1,09,13,450	584,978	1,79,16,200

* This is the correct figure.

This statement is compiled from returns submitted for the Orissa and Midnapore canals by the Deputy Revenue Superintendents, and for the Sone canals by the Superintending Engineer. The percentage of increase shown in the area irrigated is 18, while that of the value of crops raised by canal water is 64; a result brought about by a general rise in prices, as well as a general improvement in the outturn from irrigated lands. Several glaring inaccuracies in the returns of valuation for 1887-88, some of which were noticed in the Chief Engineer's note of that year, have been corrected in the comparative statement given above. For instance, Rs. 12 per acre, given by the Deputy Revenue Superintendent as the value of the Orissa rice crop of 1887-88, is now admitted to have been much too low an estimate, and is raised to Rs. 18 per acre, which compares to Rs. 32 per acre, the valuation of the same crop in 1888-89. Similar errors noticed in the returns received from the Sone canals have also been corrected. The following abstract, compiled from the corrected figures, shows that on these canals there has been an increase in the value per acre of food-grains and sugarcane and a decrease in the value of opium:—

CROPS.	RATES PER ACRE.					
	1887-88.			1888-89.		
	Eastern Sone.	Arrah.	Buzar.	Eastern Sone.	Arrah.	Buzar.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Sugarcane ...	96-8	50	100	106-4	100	100
Wheat ...	28	17-5	28	28	24	28
Barley ...	22-5	12-5	22	22	15	22
Rice ...	24	19	32	30	29-8	28
Miscellaneous cereals ...	12-5	12	14	24	18-4	19-7
Opium ...	75	40	48	49	39	48

124. The state of the canal plantations on Major works is shown in the PLANTATIONS following statement:—

CANALS.	1887-88.			1888-89.		
	Trees 12 feet high and above.	Saplings between 4 and 12 feet.	Seedlings.	Trees 12 feet high and above.	Saplings between 4 and 12 feet.	Seedlings.
	No.	No.	No.	No.	No.	No.
Orissa Canals ...	40,339	23,039	59,450	50,318	21,571	49,932
Midnapore Canal ...	6,959	4,640	4,788	8,128	5,617	6,315
Midgellie Tidal Canal ...	1,173	3,875	8,121	1,632	4,299	2,594
Sone Canals ...	106,178	58,373	132,011	120,787	60,719	137,854
Total ...	154,649	89,927	199,370	180,865	92,106	196,695

NAVIGATION
RECEIPTS.

125. The toll collections on each canal system, with the percentage of cost of collection on receipts, and the cost of measuring each boat, are given below:—

	TOLL COLLECTIONS.		PERCENTAGE OF CHARGES FOR COLLECTION TO AMOUNT COLLECTED.		COST OF MEASURING EACH BOAT.	
	1887-88.	1888-89.	1887-88.	1888-89.	1887-88.	1888-89.
<i>Works partly for Irrigation and partly for Navigation.</i>	Rs.	Rs.	Rs.	Rs.	Annas.	Annas.
Orissa Canals ...	66,628	69,830	13.7	13.6	5.8	7.1
Midnapore Canal ...	1,26,574	1,46,760	6.1	5.1	3.5	3.2
Sone Canals ...	50,984	62,162	28.0	25.1	28.2	25.8
Total ...	2,44,186	2,68,752	12.7	11.2	6.0	5.8
<i>Works for Navigation only.</i>						
Hidgellee Tidal Canal ...	40,406	53,910	7.4	5.9	3.5	3.1
Calcutta and Eastern Canals ...	5,71,872	5,65,491	6.8	6.7	3.7	3.5
Orissa Coast Canal ...	52,828	65,010	8.6	9.4	6.0	7.2
Nuddea Rivers ...	1,98,318	1,91,749	11.1	12.0	5.4	6.0
Total ...	8,63,424	8,76,160	7.9	8.0	4.2	4.3
GRAND TOTAL ...	11,07,610	11,44,912	...	...	...	...

The revival of trade on the Midnapore canal, which had set in in the previous year, has continued to gain strength. The two river systems alone show decreased incomes, and it is probable that the introduction of lower rates on the railways which compete with these routes was beginning to make itself felt in 1888-89, since it is found to have caused a very sensible decrease on the boat traffic in 1889-90.

126. It has not been the custom, at least of late years, to bring to notice in the Revenue Report the names of members of the establishment who may have specially distinguished themselves by their conduct of their duties; and, finding such the case, I have hitherto refrained from altering the custom, although I have by no means failed to appreciate the good work of those who have been serving under me. Where officers, as a body, are so earnest, conscientious, self-sacrificing, and hard-working, as those with whom I have been connected during my stay in the province, and where the men who do not give satisfaction are so few and far between, it must always be felt a somewhat invidious duty to select officers for special mention, and the custom of omitting all individual notice has, I confess, afforded me a sense of relief. Now, however, that I am about to sever my connection with the province, I feel that I ought not to lose this opportunity, when submitting the last Revenue Report of the province which will issue under my signature, of showing my appreciation of the more special services which some members of the establishment have rendered, and of thanking all, with but few exceptions, for their excellent work, and all without exception for their good-will, kindness and thorough loyalty towards one, who, however anxious he might be not to appear in that character, could scarcely fail to be considered as somewhat of an interloper.

The officers in charge of Circles during my tenure of office have been:—

Orissa Circle—Major McArthur, Mr. Rhind.

South-Western Circle—Messrs. Wickes and Vertannes (now retired) and Major McArthur.

Sone Circle—Mr. Odling and Major McArthur, the latter for a short time only.

One and all have conducted their duties to my entire satisfaction; but if any one is to be specially noticed, I would mention Mr. Odling for the exceptionally able manner in which he has managed his Circle at a most trying period in the existence of the Sone Canals.

Amongst officers who have been in charge of divisions during the same period, whilst nearly all have conducted their duties in an excellent manner, I would specially mention Messrs. Faulkner, Horn, Inglis, Livesay, Scotland, Shawe, Stephen, Frost, Carter; and amongst sub-divisional officers, Messrs. A. S. Thomson, Lees, Coy, Frost, Carter, C. A. White, Arnott, Silk, Barlow, Clowes, Stawell, and Searight.

During the year under review and its predecessor, the strain on the canal officers, divisional and sub-divisional, has been specially severe, and excellent service has been rendered by all in a very trying season. More especially has this been the case on the Sone Canals, where, owing to the system in force, the work thrown on the engineering staff is heavier than it is elsewhere, and the Superintending Engineer brings prominently to notice the excellent service rendered by the divisional and sub-divisional canal officers in an exceptionally trying season.

I travelled over the greater part of the main canals in 1889, just when the severe demand was commencing to subside, so that I have personal knowledge of the difficulties experienced. The Divisional Engineers, Mr. Horn, Buxar; Mr. Inglis, Arrah; and Mr. Frost, Eastern Sone, are distinctly entitled to praise for the successful exertions they made to extend the benefits of irrigation as widely as possible, and Mr. Stephen, the Executive Engineer at Dehree, is equally deserving of credit for the promptitude with which he conducted the difficult operation of closing the vents in the under-sluiques at Dehree. The Superintending Engineer's commendation of the sub-divisional officers was well earned.

Lastly, I thank heartily for their good work the officers who have performed the duties of Under-Secretary—Major McArthur and Messrs. Buckley and Shawe. I have invariably found them most helpful and loyal, and of the greatest assistance in every portion of the duties of my office.

127. The date for the submission of Revenue Reports to the office of the Chief Engineer is the 15th September. The dates when the different reports were received are shown below:—

	In 1888.	In 1889.
Orissa Circle	... { Commissioner's report ... 26th October...	3rd October.
	... { Superintending Engineer's report 3rd ditto ...	9th ditto.
South-Western Circle	{ Commissioner's report ... 24th September	16th September.
	{ Superintending Engineer's report 24th ditto ...	28th ditto.
Sone Circle	{ Commissioner's report ... 6th October	28th September.
	{ Superintending Engineer's report 17th September	14th ditto.

The reports were punctual, with the exception of those of the Commissioner of the Orissa Division and the Superintending Engineer, Orissa Circle. The Finance and Administrative Accounts of the year 1888-89 due on the 1st were received from the Examiner on the 22nd August.

C. W. I. HARRISON, LT.-COL., R.E.,

The 6th January 1890.

Offg. Chief Engineer.

IA.

PUBLIC WORKS DEPARTMENT.

STATEMENT OF CANALS IN THE PROVINCE OF BENGAL.

Source of supply of water	ORISSA CANALS.			Madrass Canal.	Hidde-like Tidal Canal.	SOME CANALS.			River Gunduck.	Calcutta and Backwater Canals.	Orissa Canal.
	Mahanuddy River.	Rivers Brahmini and Bytarni.	Total.			Western Canal Sone.	Eastern Canal Sone.	Total.			
...	River Mahanuddy.	Rivers Brahmini and Bytarni.		River Cosaye.	Rivers Rupnarain and Ruesulpore.	River Sone.				River Hooghly and Soonderbund Creeks.	Rivers Ruesulpore, Subarnreka, Pauchijera, Burraho-long, and Motai.
Minimum discharge of river—cubic feet per second ...	Not observed	1,205.82	1,205.82	700	Tidal canal for navigation only.	6,267, October 22nd, 1883.	1,613	4,343	6,063	Tidal canal for navigation only.	Tidal canal for navigation only.
Maximum discharge of canal—cubic feet per second ...	1,568	728.56	2,296.48	200	Tidal canal for navigation only.	1,808, February 16th, 1884.	41.68	41.06	41.36	Tidal canal for navigation only.	Tidal canal for navigation only.
Average annual rainfall ... Inches	417	173.33	689.33	100	Tidal canal for navigation only.	417, May 27th, 1879.	406.165	1,322,354	64,000	Tidal canal for navigation only.	Tidal canal for navigation only.
Gross area commanded ... Acres	3,902	2,136.00	6,038.00	1,400	Tidal canal for navigation only.		817,307	1,033,063	50,100	Tidal canal for navigation only.	Tidal canal for navigation only.
Culturable ditto ...	48.36	51.40	99.76	69.13	Tidal canal for navigation only.		308,040	707,360	50,000	Tidal canal for navigation only.	Tidal canal for navigation only.
Area irrigable by complete project ...	373,772	187,500	561,272	180,000	Tidal canal for navigation only.		309,040	707,360	20,000	Tidal canal for navigation only.	Tidal canal for navigation only.
Area irrigable at present ...	439,951	137,500	577,451	175,160	Tidal canal for navigation only.		309,040	707,360	20,000	Tidal canal for navigation only.	Tidal canal for navigation only.
Sanctioned estimate—											
Direct charges ... Rs.		3,13,96,220	3,13,96,220	83,16,778	17,72,659	2,78,88,097	13,59,607	28,07,327	6,63,521	...	24,45,743
Indirect do. ...		9,19,626	9,19,626	1,84,216	44,807	13,59,607	13,59,607	28,07,327	33,111	...	1,56,566
Interest during construction ...		1,21,54,723	1,21,54,723	38,80,294	2,17,460	28,07,327	28,07,327	28,07,327	...	...	...
Total estimate—		4,44,70,568	4,44,70,568	1,23,61,777	20,34,966	3,22,55,531	3,22,55,531	3,22,55,531	6,93,633	..... (a)	38,02,307

IB.

PUBLIC WORKS DEPARTMENT, BENGAL.

CAPITAL ACCOUNTS OF IRRIGATION WORKS IN BENGAL FOR AND TO END OF 1888-89.

DIRECT CHARGES—NET EXPENDITURE.											
	Works.	Establishment.		Tools and plant.		Suspense account.	Loss by exchange.	Total.	Indirect charges, exclusive of interest.	Total capital, excluding interest.	Simple interest.
		Rs.	Rs.	Rs.	Rs.						
Major Irrigation Works.											
Orissa project	{ To end of previous year	1,63,78,368	41,83,995	19,58,232	1,25,218	2,29,13,883	2,68,070	2,29,13,883	5,16,202	2,34,30,085	1,28,54,084
	{ During 1888-89	4,80,714	1,06,375	15,043	21,307	6,23,439	.....	6,23,439	15,279	6,38,718	9,29,024
Midnapore canal	{ To end of previous year	53,30,800	19,15,054	8,82,328	40,363	82,63,345	94,800	82,63,345	1,83,658	84,47,003	50,87,143
	{ During 1888-89	—40	1	—429	3,133	2,665	.....	2,665	53	2,718	3,30,587
Tidal canal	{ To end of previous year	12,66,239	4,49,790	56,670	.....	17,95,489	22,790	17,95,489	44,807	18,40,296	12,58,963
	{ During 1888-89	.....	.....	.....	.....	.....	.....	.....	.....	.....	71,820
Same project	{ To end of previous year	1,79,22,464	50,28,525	19,57,439	1,75,571	2,51,36,239	52,240	2,51,36,239	8,95,662	2,60,31,901	1,25,23,888
	{ During 1888-89	93,206	20,691	21,776	12,770	1,48,443	...	1,48,443	2,897	1,51,340	10,08,418
Total	{ To end of previous year	4,08,97,871	1,15,77,364	48,54,669	3,41,152	5,81,08,956	4,37,900	5,81,08,956	16,40,329	5,97,49,285	3,17,24,078
	{ During 1888-89	5,73,880	1,27,067	36,390	37,210	7,74,547	.....	7,74,547	18,229	7,92,776	23,39,849
Minor Works and Navigation.											
Tirhoot project	{ To end of previous year	90,685	4,33,943	6,797	.....	.....	.....	5,31,425	74,650	6,06,075	.....
	{ During 1888-89	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Damodar project...	{ To end of previous year	52,677	94,864	4,800	.....	1,52,341	.....	1,52,341	16,239	1,68,580	.....
	{ During 1888-89	—1,200	.....	.....	.....	—1,200	.....	—1,200	.....	—1,200	.....
Sarun project	{ To end of previous year	4,79,448	1,64,170	25,612	.....	6,69,230	.....	6,69,230	27,183	6,96,413	.....
	{ During 1888-89	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Orissa coast canal	{ To end of previous year	31,45,795	7,00,898	1,71,347	38,222	40,56,262	.....	40,56,262	98,461	41,55,123	.....
	{ During 1888-89	70,295	24,963	3,464	—911	97,811	.....	97,811	3,495	1,01,306	.....
Calcutta and Eastern canals.	{ To end of previous year	44,45,171	3,74,431	3,45,587	14,377	51,79,566	.....	51,79,566	59,550	52,39,116	.....
	{ During 1888-89	40,448	10,765	229	—3,580	47,862	.....	47,862	1,507	49,369	.....
Total	{ To end of previous year	82,13,776	17,68,306	5,54,143	52,599	1,05,88,824	.....	1,05,88,824	2,76,483	1,08,65,307	.....
	{ During 1888-89	1,09,543	35,728	3,693	—4,491	1,44,473	.....	1,44,473	5,002	1,49,475	.....
GRAND TOTAL	{ To end of previous year	4,91,11,647	1,33,45,670	54,08,812	3,93,751	6,86,97,780	4,37,900	6,86,97,780	19,16,812	7,06,14,592	3,17,24,078
	{ During 1888-89	6,85,423	1,62,795	40,083	32,719	9,19,020	.....	9,19,020	23,231	9,42,251	23,39,849

I

PUBLIC WORKS

STATEMENT SHOWING THE FINANCIAL RESULTS OF IRRIGATION

Realisations under Main heads of

IRRIGATION WORKS.	REVENUE (ACTUAL RECEIPTS).									
	IRRIGATION.			Navigation.	Plantations and land.	Water-power.	Miscellaneous.	Total.	Refunds of revenue.	Gross revenue, less refunds.
	Water-rates directly paid.	Share of land revenue.	Total.							
1	2	3	4	5	6	7	8	9	10	11
<i>Major Irrigation Works.</i>	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Orissa project	1,51,365	.....	1,51,365	77,608	1,450	.....	12,793	2,48,515	221	2,48,294
Midnapore canal	91,016	.....	91,016	1,49,430	44	.....	11,253	2,51,796	285	2,51,510
Tidal .. ..	.....	.....	.....	53,221	64	.....	1,198	55,170	73	55,097
Bome project	7,50,554	.....	7,50,554	57,529	323	835	20,256	8,28,698	12,011	8,27,487
Total	10,01,937	.....	10,01,937	2,39,128	1,941	835	34,014	12,94,303	12,190	12,82,113
<i>Minor Works and Navigation.</i>										
Tirhoot project ... ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Damodar .. ..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Burn	20,415	.....	20,415	.....	6	.....	203	20,614	.....	20,614
Orissa coast canal ... ..	.....	.....	.....	65,047	.....	.....	1,201	66,248	254	65,994
Calcutta and Eastern canals .. ..	.....	.....	.....	5,00,930	711	.....	4,513	5,74,144	19	5,74,125
Kuddan rivers .. ..	.....	.....	.....	1,91,791	.....	.....	97	1,91,888	.....	1,91,888
Total	20,415	.....	20,415	8,58,766	717	.....	4,714	9,54,974	273	9,54,701
GRAND TOTAL	10,22,352	.....	10,22,352	11,97,894	2,658	835	38,728	22,49,277	12,463	22,36,814

(a) Irrigation revenue officers specially
 NOTE.—The charges for "Direction" and "Executive" establishment have been equally

Revenue and Working expenses.

employed in collection of revenue, (approximately) apportioned under the heads "Revenue Management" and "Maintenance."

IIC.
PUBLIC WORKS DEPARTMENT, BENGAL.
STATEMENT SHOWING THE FINANCIAL RESULTS OF IRRIGATION WORKS IN BENGAL FOR THE YEAR 1888-89 BASED ON
ACTUAL RECEIPTS.

Principal results of operations for the year ended 31st March 1889.

IRRIGATION WORKS.	1	2	3	4	5	6	SURPLUS REVENUE AFTER PAYING INTEREST ON DIRECT CAPITAL OUTLAY.		EXCESS CHARGES, INCLUDING INTEREST ON DIRECT CAPITAL OUTLAY.	
							Amount.	Percentage on total sum at charge.	Amount.	Percentage on total sum at charge.
MAJOR IRRIGATION WORKS.										
<i>In operation.</i>										
Total Canal	...	18,40,296	55,097	78,040	Rs.	71,820	Rs.	94,763	Rs.	5-15
<i>In progress.</i>										
Orissa Project	...	2,40,68,803	2,43,294	4,05,019	Rs.	9,29,024	Rs.	10,90,749	Rs.	4-53
Nidnapore Canal	...	84,49,721	2,61,510	2,09,804	Rs.	8,30,587	Rs.	2,88,881	Rs.	8-43
Sone Project	...	2,61,83,241	8,81,278	7,94,019	Rs.	10,08,418	Rs.	9,71,672	Rs.	3-71
Total	...	6,05,42,061	13,81,179	14,87,295	Rs.	23,39,849	Rs.	24,45,955	Rs.	4-04
MINOR WORKS AND NAVIGATION.										
<i>In operation.</i>										
Sarun Project	...	6,96,413	20,814	36,392	Rs.	15,518	Rs.	...	Rs.	...
Calcutta and Eastern Canals	...	62,58,455	5,75,125	2,93,801	Rs.	2,81,324	Rs.	...	Rs.	...
Nudda River	1,91,898	1,40,769	Rs.	61,119	Rs.	...	Rs.	...
<i>In progress.</i>										
Orissa Coast Canal	...	42,56,429	66,174	77,018	Rs.	...	Rs.	...	Rs.	...
<i>Abandoned or held in abeyance.</i>										
Tinheet Project	...	6,06,075	...	...	Rs.	...	Rs.	...	Rs.	...
Damodar Project	...	1,67,380	...	...	Rs.	...	Rs.	...	Rs.	...
Total	...	1,10,14,782	8,54,031	5,47,920	Rs.	3,08,081	Rs.	...	Rs.	...

III.

PUBLIC WORKS DEPARTMENT, BENGAL.

DEMANDS AND REALIZATIONS DURING THE YEAR 1888-89.

	Balance of demand un- realized at commence- ment of year.	Demands of the year.	Total.	Deduct remissions and interest- ing cash refunds.	Net total.	Deduct amount un- realized at close of the year.	Actual receipts of the year.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
<i>Major Irrigation Works.</i>							
Orissa project	92,109	2,88,915	3,81,024	22,912	3,58,112	1,14,597	2,43,515
Midnapore canal	56,493	2,84,116	3,40,609	4,041	3,36,568	84,773	2,51,795
Tidal do ... ..	.....	55,170	55,170	.....	55,170	.....	55,170
Sone project	4,11,281	8,37,550	12,48,831	24,329	12,24,502	3,80,613	8,43,889
Total	5,59,883	14,65,751	20,25,634	51,282	19,74,352	5,79,983	13,94,369
<i>Minor Works and Navigation.</i>							
Sarun project	33,492	22,249	55,741	.....	55,741	34,927	20,814
Orissa Coast canal ... ..	.....	66,428	66,428	.....	66,428	.....	66,428
Calcutta and Eastern canals ..	.....	5,75,144	5,75,144	.....	5,75,144	.....	5,75,144
Nuddea rivers ... ..	.....	1,91,888	1,91,888	.....	1,91,888	.....	1,91,888
Total	33,492	8,55,709	8,89,201	.....	8,89,201	34,927	8,54,274
GRAND TOTAL	5,93,375	23,21,460	29,14,835	51,282	28,63,553	6,14,910	22,48,643

NOTE A.—Refunds of revenue have not been deducted from actual receipts of the year.

NOTE B.—The demand of the year, as shown in this table, is that portion of the demand which was both legally recoverable and of which the assessments were completed, within the year.

IVO.

PUBLIC WORKS DEPARTMENT, BENGAL.

STATEMENT SHOWING THE FINANCIAL RESULTS OF IRRIGATION WORKS IN BENGAL FOR THE YEAR ENDED 1888-89
BASED ON ASSESSMENTS OF THE YEAR.*Principal results of operations for the year ended 31st March 1889.*

IRRIGATION WORKS.	Capital outlay (direct and indirect) to end of the year.	REVENUE ASSESSED DURING THE YEAR.								Working expenses, direct and indirect.	Not assessed revenue of the year.	Percentage on capital outlay to end of the year.
		DIRECT ASSESSED REVENUE.						Indirect revenue due to operations of canal.	Grand Total.			
		Occupiers' rate (water rates).	Quarries' rate.	Plantations.	Water power.	Navigation.	Miscellaneous.						Total.
MAJOR IRRIGATION WORKS.												
Orissa project	Rs. 2,40,68,803	Rs. 2,42,808	Rs.	Rs. 1,460	Rs.	Rs. 77,908	Rs. 12,792	Rs. 3,34,968	Rs.	Rs. 4,05,019	Rs. -70,061	29 Deficit.
Midnapore canal	84,49,721	1,31,433	44	.....	.....	1,49,480	11,255	2,92,212	.....	2,79,804	82,408	27
Tidal canal	18,40,296	.....	.....	64	.....	63,921	1,185	65,170	.....	78,040	-22,870	124 Deficit.
Sone project	2,61,83,241	8,05,790	.....	383	835	57,829	25,286	8,90,123	.....	7,91,432	96,691	36
Total	6,05,42,061	11,80,031	.....	1,941	835	2,39,138	60,518	(a) 15,72,463	.....	14,87,296	-85,168	14
MAJOR WORKS AND NAVIGATION.												
Sarun project	6,90,413	21,850	.....	6	.....	.....	393	22,249	.....	36,332	-14,083	202 Deficit.
Orissa Coast canal	42,56,429	.....	.....	.....	.....	65,047	1,361	66,428	.....	77,018	-10,590	24 Deficit.
Calcutta and Eastern canals	52,88,485	.....	.....	60	.....	6,69,920	6,158	6,76,144	.....	2,48,891	2,81,343	533
Nudda rivers	.....	.....	.....	.....	.....	1,91,791	97	1,91,888	.....	1,30,769	61,119	.....
Total	1,02,41,227	21,850	.....	72	.....	8,20,768	7,029	(a) 8,65,709	.....	6,47,920	3,07,789	300

Note.—In this table the water-rates shown as assessed during the year are the amounts for which occupiers have rendered themselves liable in return for canal water supplied during the year, and include some demands which were not legally recoverable, and others of which the assessment papers were not completed, till after the close of the year.

(a) Refunds and remissions of revenue have not been deducted from the gross assessments shown above.

ID.

PUBLIC WORKS DEPARTMENT, BENGAL.

STATEMENT OF TRAFFIC ON CANALS IN BENGAL DURING THE YEAR 1888-89.

	Orissa canals.	Madras canal.	Hidgellee Tidal canal.	Rane canals.	Calcutta and Eastern canals.	Orissa Coast canal.	Total.	Nuddra river.
Length of canal open for navigation ... Miles	177	73	29	215½	(a) 27	97½	621	407
Receipts—Tollage on private boats ... Re.	62,183	(b) 1,44,084	33,446	34,746	5,65,337	64,217	9,24,568	1,99,919
Government boats ...	5,476	.....	209	9,232	.....	453	15,369	.....
Rafts ...	2,219	2,076	254	8,184	159	340	13,236	630
Carrying operations or transport } Government services. } boats ...	8,078	.....	.....	(c) 5,667	.....	.....	13,745	.....
Fines and sundries ...	.....	2,720	11	.....	4,629	37	7,197	42
Total receipts ...	77,066	1,46,480	33,661	37,829	5,69,995	64,617	9,74,165	1,99,791
Maintenance charges, including special navigation establishment ...	46,666	12,440	75,040	40,373	2,83,601	77,015	3,49,314	1,40,760
Net revenue of year ...	31,392	1,37,600	(—) 41,419	17,456	2,73,119	(—) 11,407	4,25,787	61,033
Total number of boats plying cargo ... No.	10,136	21,077	15,411	4,619	104,349	11,183	154,694	23,309
passenger ...	1,319	13,443	1,070	411	6,667	1,479	26,440	19,333
registered tonnage of boats by canal measure- ment, cargo ... Tons	123,581½	318,020	153,935	83,775	2,778,743	136,854	3,579,731½	539,366
registered tonnage of boats by canal measure- ment, passenger ...	20,789½	73,023	11,080	9,474	33,233	20,367	167,366½	13,126
Ton mileage—Up ...	1,006,482	3,477,235	1,629,336	1,540,820	22,133,832	2,210,031	33,214,802	.....
Down ...	2,460,066	3,549,311	1,220,153	3,892,800	2,994,862	1,585,910	15,443,702	.....
Total ...	4,307,123	9,320,066	3,140,529	4,942,020	25,128,694	3,795,941	50,638,504	.....
Estimated value of cargoes—Up ... Re.	22,47,397	40,56,943	16,14,168	20,05,402	6,28,62,620	13,11,721	7,01,83,186	1,43,89,845
Down ...	21,02,402	70,27,254	16,80,290	34,48,954	62,13,093	10,42,269	2,36,03,181	2,23,04,456
Total ...	43,59,799	1,30,84,196	32,93,457	54,54,356	7,10,75,713	23,53,990	9,38,86,367	3,66,94,301
Number of passengers—Total ... No.	98,203	107,339	34,032	40,634	63,037	53,070	415,735	59,623
Rafts, feet×feet×feet—Up ... c. ft.	47,746	182,974	5,373	18,135	21,039	10,240	291,789	7,463
Down ...	229,783	3,701	28,244	2,701,651	21,222	10,109	3,033,710	100,102
Total ...	336,529	186,675	33,617	2,720,076	42,261	20,349	3,315,399	113,567
Estimated value of rafts—Total ... Re.	60,168	80,073	17,710	2,59,083	79,306	9,379	6,12,415	1,04,246
Tollage on boats per ton per mile ...	3'61 pias	2'9 pias	3'3 pias	17 pias	.....	3'3 pias	.....	.....
Tollage on rafts per 100 cubic feet ...	0'65 rupees	1-1-9 rupees	1'4 annas	4'7 annas	.....	1'29 rupees	.....	0'84 rupees

(a) This length is that of the Calcutta and new canals and Tolly's nullah. The Eastern canals are 313 miles in length, of which the larger boat route 165 miles, outer boat route 127 miles, and summer route 350 miles. — total length 690 miles.

(b) Includes toll, amounting to Rs. 21,628, paid by Messrs. Hanco, Muller & Co., who maintain a transport service on the canal.

(c) This consists of (1) hire of three Government steamers, Rs. 4,000; (2) hire of four Government cargo boats, Rs. 1,360; and (3) hire of the accommodation, jolly-boats and mud punts, Rs. 897.

IID.

PUBLIC WORKS DEPARTMENT, BENGAL.

DESCRIPTION AND QUANTITIES OF GOODS, &c., CARRIED ON CANALS IN BENGAL DURING THE YEAR 1888-89.

[illegible]

IID—concluded.

PUBLIC WORKS DEPARTMENT, BENGAL.

DESCRIPTION AND QUANTITIES OF GOODS, &c., CARRIED ON CANALS IN BENGAL DURING THE YEAR 1888-89.

ORISSA COAST CANAL.										CALCUTTA AND EASTERN CANALS.										MUDDER RIVER.									
TOTAL.					PRIVATE.					TOTAL.					TOTAL.					TOTAL.					TOTAL.				
Quantity—Tons.					Quantity.					Quantity—Tons.					Quantity—Tons.					Quantity.					Quantity.				
Up.	Down.	Total.	Value.	Rs.	Up.	Down.	Total.	Value.	Rs.	Up.	Down.	Total.	Value.	Rs.	Up.	Down.	Total.	Value.	Rs.	Up.	Down.	Total.	Value.	Rs.	Up.	Down.	Total.	Value.	Rs.
Grain ...	22,416	22,416	12,59,972	12,59,972	25,100	7	25,107	12,59,979	25,107	327,564	61	327,564	2,01,97,011	2,01,97,011	327,564	327,564	2,01,97,011	2,01,97,011	2,01,97,011	327,564	327,564	327,564	2,01,97,011	2,01,97,011	327,564	327,564	327,564	2,01,97,011	2,01,97,011
Oilseeds ...	156	156	12,435	12,435	144	7	151	12,435	12,435	9,853	717	9,853	3,61,550	3,61,550	9,853	9,853	3,61,550	3,61,550	3,61,550	9,853	9,853	9,853	3,61,550	3,61,550	9,853	9,853	9,853	3,61,550	3,61,550
Salt ...	10	10	2,21,550	2,21,550	2,203	144	2,203	2,21,550	2,21,550	12,000	60,340	72,340	75,16,804	75,16,804	72,340	72,340	75,16,804	75,16,804	75,16,804	72,340	72,340	72,340	75,16,804	75,16,804	72,340	72,340	72,340	75,16,804	75,16,804
Free-goods ...	217	217	1,53,315	1,53,315	217	...	217	1,53,315	1,53,315	...	...	...	...	...	217	...	217	...	...	217	...	217	...	...	217	...	217	...	...
Metals ...	11	11	8,463	8,463	56	...	56	8,463	8,463	686	344	1,030	2,32,000	2,32,000	1,030	1,030	2,32,000	2,32,000	2,32,000	1,030	1,030	1,030	2,32,000	2,32,000	1,030	1,030	1,030	2,32,000	2,32,000
Building materials ...	307	307	9,000	9,000	340	...	340	9,000	9,000	91,229	1,305	98,534	11,56,629	11,56,629	98,534	98,534	11,56,629	11,56,629	11,56,629	98,534	98,534	98,534	11,56,629	11,56,629	98,534	98,534	98,534	11,56,629	11,56,629
Miscellaneous ...	2,007	2,007	5,36,010	5,36,010	6,227	...	6,227	5,36,010	5,36,010	249,519	12,473	261,992	3,00,21,300	3,00,21,300	261,992	261,992	3,00,21,300	3,00,21,300	3,00,21,300	261,992	261,992	261,992	3,00,21,300	3,00,21,300	261,992	261,992	261,992	3,00,21,300	3,00,21,300
Fuel ...	564	564	19,545	19,545	1,693	...	1,693	19,545	19,545	108,354	24,793	133,147	15,03,577	15,03,577	133,147	133,147	15,03,577	15,03,577	15,03,577	133,147	133,147	133,147	15,03,577	15,03,577	133,147	133,147	133,147	15,03,577	15,03,577
Timber ...	8,678	8,678	8,211	8,211	10,715	...	10,715	8,211	8,211	19,008	31,223	50,231	78,293	78,293	50,231	50,231	78,293	78,293	78,293	50,231	50,231	50,231	78,293	78,293	50,231	50,231	50,231	78,293	78,293
Bamboo ...	7,302	7,302	1,395	1,395	15,034	...	15,034	1,395	1,395	1,070	...	1,070	1,000	1,000	1,070	1,070	1,000	1,000	1,000	1,070	1,070	1,070	1,000	1,000	1,070	1,070	1,070	1,000	1,000
Total ...	35,967	11,549	46,715	25,63,569	40,397	...	40,397	25,63,569	25,63,569	847,305	104,754	952,059	1,11,54,835	1,11,54,835	847,305	847,305	1,11,54,835	1,11,54,835	1,11,54,835	847,305	847,305	847,305	1,11,54,835	1,11,54,835	847,305	847,305	847,305	1,11,54,835	1,11,54,835
Total (C. ft.)	10,240	10,109	20,349	20,349	20,349	...	20,349	20,349	20,349	31,083	31,223	62,306	62,306	62,306	31,083	31,083	62,306	62,306	62,306	31,083	31,083	31,083	62,306	62,306	31,083	31,083	31,083	62,306	62,306

Supplementary statement giving details of "Miscellaneous" articles of traffic on the Calcutta and Eastern Canals.

DESCRIPTION.			Quantity.		Value.		
			Tons.		Rs.		
Jute	...	...	157,454	157,454	1,07,000	1,07,000	
Joergy	...	...	12,403	12,403	13,47,143	13,47,143	
Sugar	...	...	1,102	1,102	2,82,835	2,82,835	
Tobacco	...	...	1,533	1,533	3,01,091	3,01,091	
Fish	...	...	1,404	1,404	7,05,130	7,05,130	
Hides	...	...	909	909	40,114	40,114	
Poultry	...	...	16,544	16,544	2,06,213	2,06,213	
Key and straw	...	...	13,108	13,108	3,28,144	3,28,144	
oil	...	...	8,190	8,190	19,47,408	19,47,408	
Earthware	...	...	67,116	67,116	8,190	8,190	
Other miscellaneous	...	...	67,117	67,117	97,18,290	97,18,290	
Total	...	...	285,192	285,192	3,00,21,300	3,00,21,300	

IE.

PUBLIC WORKS DEPARTMENT, BENGAL.

STATEMENT OF AREAS IRRIGATED BY IRRIGATION WORKS IN BENGAL DURING THE YEAR 1898-99.

NAME OF CANAL.	AREAS IRRIGATED IN ACRES.				AVERAGE DISCHARGE, CUBIC FEET PER SECOND.				AREAS IRRIGATED PER CUBIC FOOT PER SECOND.				
	Kharif.	Rabi.	Total.	Flow.	1 ft.	DOUBLE-CROPPED.		AT HEAD.		UTILIZED.		DISCHARGE AT HEAD.	
						Area irrigated.	Percentage of total area.	Kharif.	Rabi.	Kharif.	Rabi.	Kharif.	Rabi.
Kandrapore Canal and its branches	70,274	2,522	72,796	68,324	4,673	...	...	709 84	251 42	709 97	213 31	92 45	107 25
Taldanah ditto	40,143	226	40,369	38,930	1,641	...	...	446 25	62 25	144 25	17 00	50 40	217 40
High Level Canal, Range I	14,001	1	14,002	10,441	1,641	...	...	235 76	146 12	161 48	36 51	70 73	117 02
Total Mahanuddy Series	124,418	2,749	127,167	107,695	7,975	...	...	1,391 85	459 79	1,047 20	266 83	83 58	157 73
High Level Canal, Range II	2,335	30	2,365	2,334	81	...	...	75 97	14 54	75 97	2 30	39 09	2 02
Ditto, ditto III	25,029	...	25,029	23,428	3,601	...	...	128 09	39 46	128 09	24 27	260 07	230 07
Total Brahmini-Etarnal Series	27,063	30	27,093	25,760	3,681	...	...	204 06	53 30	204 06	60 57	137 13	9 74
Total Orissa Canals	154,213	2,779	156,992	131,093	7,927	...	...	1,705 91	604 29	1,251 26	267 40	91 74	155 09
Under Midnapore weir	60,283	...	60,283	60,283	...	...	...	370	...	346	...	153	164
Under Panchkoora weir	9,314	...	9,314	9,459	64	...	...	50	40	30	3	111	165
Total Midnapore Canal	69,597	...	69,597	69,742	64	...	...	...	...	...	...	...	...
Eastern Main Series	55,559	11,426	66,985	63,979	3,025	...	...	1,123	325	996	273	49 4	27 6
Western ditto	191,263	97,531	288,794	299,673	20,441	...	...	2,664	1,733	2,216	1,366	71 6	60 00
Total Sonu Canals	246,822	108,957	355,779	357,645	23,466	...	...	3,787	2,258	3,212	1,541	60 2	27 6
Saru Canals	2,697	3,316	6,013	...	...	...	...	202	233	293	203	13 6	15 6

III.
PUBLIC WORKS DEPARTMENT, BENGAL.
STATEMENT SHOWING INCIDENCE OF WORKING EXPENSES AND ASSESSED WATER-RATES ON CANALS
IN BENGAL DURING 1888-89.

NAME OF CANAL.	WATER-RATE ASSESSED IN 1888-89.				From assessed revenue from all sources.		Working expenses, direct and indirect.		Arrears irrigated during the year 1888-89.	WORKING EXPENSES.			OCTUPLES'S RATE (WATER-RATE).		TOTAL WATER-RATES DIRECT AND INDIRECT.	
	(Acres) (water-rate).	Others.	Total direct.	Indirect.	Total of direct and indirect.	Rs.	Ra.	Rs.	Arrears.	Per cent. on gross revenue.	Per acre irrigated.	Per cubic foot per second of discharge at canal head.	Per acre irrigated.	Per cubic foot per second of discharge at canal head.	Per acre irrigated.	Per cubic foot per second of discharge at canal head.
Major Irrigation Works.																
Orissa project	5,45,908	.....	2,42,900	.....	2,42,900	5,45,908	4,05,619	1,39,282	157-96	2-54	1-23	.....	1-23	.....	1-23	.....
Madras canal	1,31,433	.....	1,31,433	.....	1,31,433	2,02,812	2,00,804	60,177	71-80	3-00	1-23	.....	1-23	.....	1-23	.....
Total canal .. .. .	.....	.....	.....	.....	.....	25,170	75,000	.....	.....	.....	.....	.....	.....	.....	.....	.....
Bone project	8,08,709	.....	8,08,709	.....	8,08,709	8,00,123	7,34,433	325,909	89-25	3-23	2-25	.....	2-25	.....	2-25	.....
Total	11,86,031	.....	11,86,031	.....	11,86,031	15,72,603	14,87,256	684,978	94-34	2-54	2-03	.....	2-03	.....	2-03	.....
New Works and Navigation.																
Saran project	21,850	.....	21,850	.....	21,850	22,249	36,322	7,213	161-29	5-03	3-03	.....	3-03	.....	3-03	.....
Orissa canal .. .. .	.....	.....	.....	.....	.....	66,423	77,619	.....	115-94	.....	.....	.....	.....	.....	.....	.....
Calcutta and Eastern canal .. .. .	.....	.....	.....	.....	.....	5,75,144	1,03,401	.....	81-08	.....	.....	.....	.....	.....	.....	.....
Hodder river .. .. .	.....	.....	.....	.....	.....	1,01,883	1,40,769	.....	77-36	.....	.....	.....	.....	.....	.....	.....
Total	21,850	.....	21,850	.....	21,850	5,55,709	5,47,920	7,213	61-03	.....	.....	.....	.....	.....	.....	.....

Note A.—In this table the water-rates shown as assessed during the year are the amounts for which companies have rendered themselves liable in return for canal water supplied during the year, and include some demands which were not legally recoverable, and others of which the assessment papers were not completed, till after the close of the year.

Note B.—Columns 2, 3, 16 and 17 cannot be filled in.

III.

PUBLIC WORKS DEPARTMENT, BENGAL.

STATEMENT OF QUANTITY AND VALUE OF CROPS IRRIGATED IN BENGAL DURING THE YEAR 1888-89.

DESCRIPTION.	ORISSA CANALS.		MIDNAPPORE CANALS.		SONT CANALS.		BARUM CANALS.		TOTAL.	
	Area irrigated.	Estimated value.	Area irrigated.	Estimated value.	Area irrigated.	Estimated value.	Area irrigated.	Estimated value.	Area irrigated.	Value.
Gardens and orchards	102	18,360	...	...	33	940	...	...	135	19,300
Sugarcane	196	78,400	...	...	22,468	22,69,245	...	...	22,664	23,47,645
Wheat	...	...	...	...	42,742	11,51,410	...	...	42,742	11,51,410
Barley	...	...	...	...	15,521	2,87,002	...	...	15,521	2,87,002
Rice	156,308	50,01,856	66,865	16,46,625	221,961	66,14,164	3,785	68,130	447,919	1,32,30,776
Cereals	...	...	...	...	...	...	...	...	...	...
Maize	...	...	...	...	...	...	...	...	...	...
Juar	...	...	...	...	...	...	...	...	...	...
Cheena	1	12	...	...	...	...	...	...	...	...
Miscellaneous	26	260	...	...	4,355	63,347	2,808	56,160	7,189	1,21,767
Gram	...	...	...	...	4,640	60,186	...	...	4,640	60,186
Pulse	...	...	...	...	2,169	1,31,855	...	...	2,169	1,31,855
Peas	202	8,760	...	...	4,027	4,788	...	...	4,319	13,548
Miscellaneous	...	...	...	...	...	...	...	...	...	...
Grass, lucerne	...	...	...	...	...	...	...	...	2,126	42,535
Fodder crops	2,125	42,505	...	...	1	30	...	...	...	...
Fibre	186	12,825	...	...	1,001	40,012	112	5,600	1,299	58,437
Dye	...	...	...	...	1,785	81,479	...	...	1,785	81,479
Drugs	...	...	...	...	...	...	371	61,215	371	61,215
Opium	2	60	...	...	216	6,430	...	...	218	6,490
Tobacco	44	880	...	...	13	195	...	...	57	1,075
Oilseeds	10	250	...	...	24,209	3,94,464	137	2,740	24,356	3,97,464
Miscellaneous	...	...	...	...	...	...	...	...	...	...
Total	159,292	51,64,168	65,865	16,46,625	345,147(a)	1,10,07,607	7,213	1,93,845	577,517	1,80,12,245
Land insufficiently irrigated	...	...	3,912	97,800	...	...	...	...	3,912	97,800
GRAND TOTAL	159,292	51,64,168	69,777	17,44,425	345,147	1,10,07,607	7,213	1,93,845	581,429	1,81,10,045

(a) 345,147 acres together with 10,762 acres not-weather irrigation make up the total 355,909. The not-weather irrigation is not valued, as it is almost entirely sugarcane which is already included in the above statement.

IVE.

PUBLIC WORKS DEPARTMENT, BENGAL.

COMPARATIVE STATEMENT OF IRRIGATION AND RAINFALL FOR THE YEARS 1888-89 AND 1887-88 IN BENGAL.

Works supplying irrigation.	Civil districts.	Total area in acres.	Cultivated area in acres.	AREAS IRRIGATED IN ACRES.						Rainfall.	
				1888-89.			1887-88.			1888-89.	1887-88.
				Kharif, in- clusive of sugarcane.	Rabi, inclu- sive of hot- weather.	Year.	Kharif, in- clusive of sugarcane.	Rabi, inclu- sive of hot- weather.	Year.		
Orissa canals	{ Outtack ... Balasore ... Total Orissa Canals	.....	.....	130,885	2,779	133,664	101,435	502	101,937	Inches.	Inches.
		.....	.....	25,628	.....	25,628	7,569	.....	7,569	46.52	53.20
		.....	.....	156,513	2,779	159,292	109,004	502	109,508	49.55	49.86
Midnapore canal	Midnapore	.....	.....	66,408	3,369*	69,777	64,702	1,162*	65,864	68.00	55.38
	
Sone canals	{ Shahabad ... Patna ... Gya .. Total Sone canals	2,806,400	2,192,500	191,363	97,551	288,914	190,702	63,477	254,179	44.78	41.23
		1,329,920	1,039,000	25,783	6,637	31,390	25,583	2,537	28,120	48.91	39.47
		3,015,680	2,356,000	29,806	5,799	35,605	29,150	3,931	33,081	51.88	38.95
Saran canals	Saran	7,152,000	5,587,500	246,922	108,987	355,909	245,435	69,945	315,380	... ..	.....
	
		1,680,000	1,312,500	3,897	3,316	7,213	1,904	2,314	4,218	42.40	39.66
GRAND TOTAL.		.....	.....	473,740	118,451	592,191	421,045	73,928	494,968	.....	.....

* Bare rice.

No. 1F (*vide* GOVERNMENT OF INDIA'S ORDER No 110I, DATED 6TH JUNE 1889.)STATEMENT SHOWING THE WATER-RATES PER ACRE IN FORCE ON
CANALS IN BENGAL DURING THE YEAR 1888-89.

Canals.	DESCRIPTION OF LEASES AND CROPS	OCCUPIERS' RATES PER ACRE.	
		Flow irrigation.	Lift irrigation.

ORISSA CIRCLE.

		Rs. A. P.			Rs. A. P.		
ORISSA CANALS	I.—For the whole irrigable or rice cultivated area of any village if application is made for a lease of five years ...	1	8	0	1	0	0
	<i>For the rice crop.</i>						
	II.—For any fractional area of a village or for other terms ...	3	0	0	2	0	0
	<i>For cold-weather crops.</i>						
	III.—Dalua rice ...	1	8	0	1	0	0
	IV.—For cotton, tobacco, haldi, ginger, wheat, vegetables, indigo, and all garden produce grown in villages the rice lands of which are leased under rate I ...	1	0	0	0	10	0
	V.—For the above produce when grown in villages the rice lands of which are not leased under rate I ...	2	0	0	1	8	0
	VI.—For linseed, oilseed, dal and all pulses grown in villages the rice lands of which are not leased under rate I ...	0	8	0	0	5	0
	VII.—For the above produce when grown in villages the rice lands of which are not leased under rate I ...	1	0	0	0	10	0
	<i>For perennial crops.</i>						
	VIII.—For sugarcane ...	6	0	0	4	0	0
	IX.—The charge of filling tanks is Rs. 1 per 10,000 cubic feet of water used.						

SOUTH-WESTERN CIRCLE.

MIDNAPORE CANAL	<i>For the rice crop.</i>						
	I.—Under five-year leases ...	1	8	0	1	0	0
	II.—Under annual leases ..	2	8	0	1	10	0
	<i>For winter crops.</i>						
	III.—In exceptional cases when water is available ...	1	8	0	1	8	0
	IV.—The charge for the unauthorised use of canal water is Rs. 5 per acre per annum or such less sum as is fixed by the Collector.						

SUPPLEMENT TO THE CALCUTTA GAZETTE, FEBRUARY 5, 1890. 283

Canals.	DESCRIPTION OF LEASES AND CROPS.	OCCUPYERS' RATES PER ACRE.	
		Flow irrigation.	Lift irrigation.

SONE CIRCLE.

		Rs. A. P.	Rs. A. P.
	<i>For water supplied between the 25th June and the 1st April.</i>		
	I.—LEASES FOR ONE YEAR.		
SONE CANALS	Rice	3 0 0	2 0 0
	Bhadoi, except rice	2 8 0	1 10 8
	Rabi	2 0 0	1 10 8
	Sugarcane	5 0 0	3 5 4
	II.—LEASES FOR FIVE YEARS.		
	For all crops	2 0 0	2 0 0
	NOTE.—An extra rate in addition to the above rate is charged for water taken between the 1st April and the 25th June.		
	For water taken between the 1st April and the 25th June.		

ANNUAL LEASES ONLY.

	<i>Special rate for hot months.</i>		
	For all crops	4 0 0	2 10 8
	NOTE.—For indigo, water is allowed to be taken under this schedule from the 15th March without extra charge. Charges under this schedule are in addition to charges under the Schedules I and II.		
SARUN CANALS	The Sarun canals are not primarily irrigation canals, and the return to Government is in the shape of a guarantee amounting at present to Rs. 21,850 per annum. Guarantors are authorised to charge Rs. 1 per acre irrigated, or in the case of water being used for manufacture, Rs. 2 per maund of indigo manufactured.		

* The rate for flow irrigation was reduced from Rs. 2-8 to Rs. 2 per acre for the current season only—vide Bengal Government Notification No. 50, dated 15th February 1889.

List of Officers in charge of Irrigation Circles and Divisions during 1888-89.

Circle or Division.	Name of Officer.	Period of charge.
---------------------	------------------	-------------------

SECRETARIAT.

Joint-Secretary.	Irrigation	Colonel J. M. McNeile, R.E.	On special leave.
Branch.	ditto	Lieutenant-Colonel C. W. I. Harrison, R.E.	From 1st April 1888 to 31st March 1889.
Officiating ditto.	ditto		[Acted as Secretary in the Public Works Department, in addition to his other duties, from 15th April to 1st June 1888.]
Under-Secretary.	ditto	Major A. D. McArthur, R.E.	From 1st April to 3rd June 1888.
Officiating ditto.	ditto	Mr. G. A. G. Shawe	" 4th August 1888 to 31st March 1889.

Circle or Division.	Name of Officer.	Period of charge.
SUPERINTENDING ENGINEERS IN CHARGE OF CIRCLES.		
Orissa Circle ...	Mr. R. H. Rhind ...	From 1st April 1888 to 31st March 1889.
Ditto, Personal Assistant	" J. T. Boase ...	" 26th June 1888 to 31st March 1889.
South-Western Circle ...	" T. H. Wickes ...	" 1st April to 3rd June 1888.
	Major A. D. McArthur, R.M.	" 4th June 1888 to 31st March 1889.
Ditto, Personal Assistant	Mr. J. T. Boase ...	" 7th to 26th June 1888.
	Rai Sahib Krith Chunder Chowdry.	" 17th December 1888 to 22nd January 1889.
Sone Circle ...	Mr. C. W. Odling ...	" 1st April 1888 to 31st March 1889.
Ditto, Personal Assistant	" K. H. Stephen ...	" 14th January to 28th February 1889.

EXECUTIVE ENGINEERS IN CHARGE OF DIVISIONS.**ORISSA CIRCLE.**

Mahanuddy Division ...	Mr. G. W. Faulkner ...	From 1st April 1888 to 31st March 1889.
Aquapada-Jajepore Division	" A. Monies ...	" 1st April to 15th July 1888.
	J. P. Cleghorn ...	" 16th July 1888 to 31st March 1889.
Pooree Division ..	Rai Sahib Raj Kissen Banerjee.	" 1st to 8th April 1888.
	Mr. J. R. Swinden ...	" 9th April 1888 to 31st March 1889.
Brahmini-Byturni Division ...	" C. Taylor ...	" 1st April to 24th July 1888.
	" A. Monies ...	" 26th July 1888 to 31st March 1889.

SOUTH-WESTERN CIRCLE.

Cossye Division ...	Mr. J. P. Scotland ...	From 1st April 1888 to 31st March 1889.
Northern Drainage and Embankment Division.	" R. E. Carter ...	" 1st to 30th April 1888.
	" T. M. L. Thompson ...	" 1st May 1888 to 31st March 1889.
Nudea Rivers Division ...	" C. E. Livesay ...	" 1st April 1888 to 31st March 1889.
Circular and Eastern Canals Division.	" G. A. G. Shawe ...	" 1st April to 3rd August 1888.
	" C. Taylor ...	" 4th August 1888 to 31st March 1889.
Balasore Division ...	" A. Hayes ...	" 1st April 1888 to 31st March 1889.

SONE CIRCLE

Arrah ...	Mr. W. A. Inglis ...	From 1st April 1888 to 31st March 1889. (On privilege leave from 10th October 1888 to 10th January 1889.)
	" K. H. Stephen ...	From 10th October 1888 to 13th January 1889.
Buxar ...	" D. B. Horn ...	From 1st April 1888 to 31st March 1889.
Eastern Sone ...	" M. J. Monckton ...	" 1st April to 30th June 1888.
	" H. P. B. Frost ...	" 1st July 1888 to 31st March 1889.
Gunduck ...	" M. J. J. P. Norman ...	" 1st April 1888 to 31st March 1889.

CANAL REVENUE OFFICERS.

Deputy Collector, Shahabad...	Baboo Sarada Prasad Chatterjee.	From 1st April 1888 to 31st March 1889.
Sub-Deputy Collector, Shahabad.	Baboo Siva Sunker Sing ...	Ditto ditto. (On privilege leave from 13th to 29th September 1888.)
	" Jagdam Sahai ...	From 1st April 1888 to 31st March 1889.
Circle Officer, Patna district...	Synd Mahomed Kabeer ...	Ditto ditto.
Ditto, Gya do. ...	Baboo Moti Lal ...	Ditto ditto.
Deputy Revenue Superintendent, Orissa.	Mr. S. C. Roberts ...	Ditto ditto.
Ditto, Midnapore ...	Baboo K. C. Ghose ...	Ditto ditto. (On privilege leave from the 24th January to 31st March 1889.)
Collector of Tolls, Calcutta ...	" Rajendra Nath Roy ...	From 24th January to 31st March 1889.
	Mr. W. E. Cooksey ...	" 1st April 1888 to 31st March 1889.

**STATEMENT SHOWING THE ACTUAL RECEIPTS AND EXPENDITURE
OF PROVINCIAL SERVICES FOR 1888-89, AND THE
REVISED ESTIMATES FOR 1889-90.**

RECEIPTS.	Actual, 1888-89.	Revised estimate, 1889-90.	EXPENDITURE.	Actual, 1888-89.	Revised estimate, 1889-90.
Opening balance ...	Rs. 33,08,001	Rs. 20,58,000			
Principal Heads of Revenue—			Direct demand on the Revenues—	Rs.	Rs.
I.—Land Revenue ...	90,92,398	88,08,000	1. Refunds and drawbacks ...	1,40,120	1,38,000
III.—Salt ...	88,195	1,18,000	2. Assessments and Compen- sations ...	1,30,500	1,54,000
IV.—Stamp ...	1,23,78,000	1,06,75,000	3. Land Revenue ...	30,18,000	35,24,000
V.—Excise ...	27,73,910	25,50,000	4. Salt ...	21,273	20,000
VI.—Provincial Rates ...	61,56,324	62,57,000	6. Stamps ...	8,50,334	3,71,000
VII.—Customs ...	4,801	50,000	7. Excise ...	1,08,301	1,00,000
VIII.—Assessed Taxes ...	19,55,608	16,00,000	8. Provincial Rates ...	3,11,110	3,25,000
IX.—Forests ...	3,38,604	2,35,000	9. Customs ...	5,24,020	5,45,000
X.—Registration ...	5,46,772	5,75,000	10. Assessed Taxes ...	7,005	60,000
Total ...	2,03,26,880	2,01,48,000	11. Forests ...	1,72,701	2,35,000
			12. Registration ...	2,00,720	3,15,000
			Total ...	20,00,000	20,00,000
			13. Interest on ordinary debt ...	47,892	75,000
XII.—Interest ...	97,363	1,16,000	Post office, Telegraph and Mint—		
Post Office, Telegraph and Mint—			16. Telegraphs ...	544	1,000
XIV.—Telegraphs ...	999	1,000	Salaries and expenses of Civil Depart- ment—		
			18. General Administration ...	15,71,000	15,03,000
Receipts by Civil Department—			19. Law and Justice— Courts of Law ...	81,01,737	81,01,000
XVI.—Law and Justice— Courts of Law ...	7,80,538	7,50,000	Jails ...	17,25,703	17,00,000
Jails ...	7,75,021	7,45,000	20. Police ...	48,51,000	50,12,000
XVII.—Police ...	3,38,107	4,00,000	21. Marine ...	10,71,000	11,00,000
XVIII.—Marine ...	9,11,734	8,00,000	22. Education ...	24,25,000	24,75,000
XIX.—Education ...	6,11,824	5,70,000	23. Medical ...	14,87,000	14,00,000
XX.—Medical ...	1,30,103	1,35,000	24. Political ...	21,002	24,000
XXI.—Scientific and other Minor De- partments.	1,03,164	1,75,000	25. Scientific and other minor Departments ...	3,10,000	3,05,000
Total ...	37,57,603	36,83,000	Total ...	2,10,51,387	2,22,18,000
Miscellaneous—			Miscellaneous—		
XXII.—Receipts in aid of Superannuation ...	48,810	40,000	29. Superannuation, &c. ...	13,70,007	14,25,000
XXIII.—Stationery and Printing ...	1,75,074	1,00,000	30. Stationery and Printing ...	10,21,438	10,15,000
XXIV.—Miscellaneous ...	8,34,785	8,25,000	32. Miscellaneous ...	2,40,032	2,10,000
Total ...	10,58,768	10,34,000	Total ...	26,31,477	26,50,000
Railways—			Famine Relief and Insurance—		
XXVI.—State Railways (gross earnings) Eastern Bengal State Railway ...	61,64,854	63,50,000	33. Famine relief ...	54,358	5,75,000
Other Railways ...	55,00,005	50,30,000	37. Construction of railways ...	-10,873	-2,000
Total ...	1,17,33,859	1,22,80,000	Railways (Revenue account)—		
Irrigation—			38. State Railways— Working ex- penses ...	31,64,804	33,20,000
XXIX.—Major Works (direct receipts) ...	13,01,360	14,50,000	Other Rail- ways ...	27,81,203	27,81,000
XXX.—Minor Works and Navigation— By Public Works Department ...	8,07,841	8,30,000	Interest on debt ...	32,61,000	32,35,000
By Civil Department ...	1,02,164	1,05,000	40. Subsidized Companies—Land, &c. ...	-200	-1,000
Total ...	23,64,367	23,85,000	41. Miscellaneous Railway ex- penditure ...	1,42,033	12,000
Buildings and Roads—			Total ...	69,88,840	70,45,000
XXXII.—Civil Works— By Public Works Department ...	4,74,639	5,50,000	Irrigation—		
By Civil Department ...	1,19,600	60,000	42. Major Works— Working expenses ...	14,18,000	14,50,000
Total ...	4,74,639	6,10,000	Interest on debt ...	20,00,000	2,00,000
Contributions ...			43. Minor Works and Navigation— By Public Works Department ...	14,75,000	18,18,000
Total ...	4,87,884	4,91,000	By Civil Department ...	1,011	2,000
Closing balance ...	20,57,034	19,25,000	Total ...	30,94,011	36,70,000
GRAND TOTAL ...	5,20,03,450	5,21,46,000	Buildings and Roads—		
			44. Civil Works— By Public Works Department ...	30,94,011	30,10,000
			By Civil Department ...	1,19,600	60,000
			Total ...	40,23,611	30,70,000
			Contributions ...	7,50,000	7,45,000
			Total ...	4,04,35,000	5,01,21,000
			Closing balance ...	20,57,034	19,25,000
			GRAND TOTAL ...	5,20,03,450	5,21,46,000

Published for general information.

FINANCIAL DEPT.,
FINANCE;
The 30th January 1890.

H. J. S. COTTON,
Offg. Secy. to the Govt. of Bengal.

Rainfall, Weather, and State and Prospects of the Crops.

Statement showing Rainfall, Weather, and State and Prospects of the Crops in the different districts of Bengal, as reported to Government, during the week ending the 1st February, 1890.

No.	District and date of return.	Rainfall at Sudder Station in inches	Character of the weather and state and prospects of the crops.										
BENGAL.													
Western Districts.													
1	Burdwan Feb. 1, '90	0.06	Weather—cold. Outturn of <i>amua</i> 10 annas. <i>Rabbi</i> not favourable. Sugarcane and potato fair. Prices of common rice — <div style="float: right; text-align: right;"><table><tr><td>Srs.</td><td></td></tr><tr><td>Burdwan</td><td>16½</td></tr><tr><td>Culina</td><td>18</td></tr><tr><td>Cutwa</td><td>15½</td></tr><tr><td>Bausgunge</td><td>20</td></tr></table> } per rupee.</div>	Srs.		Burdwan	16½	Culina	18	Cutwa	15½	Bausgunge	20
Srs.													
Burdwan	16½												
Culina	18												
Cutwa	15½												
Bausgunge	20												
2	Bankura .. 1, '90	Nil	Weather—seasonable. Prospects of <i>rabbi</i> crops continue good. Coarse rice 20 seers per rupee at Sudder and 18 seers at Bishnupore.										
3	Birbhum .. 1, '90	Nil	Weather—very cold. Prospects of cold-weather crops, especially sugarcane very good. Prices of rice 16½ seers per rupee at Sudder and 16 seers at Haupore Haut.										
4	Midnapur .. 1, '90	Nil	Weather—seasonable. General prospects fair. Harvesting of rice going on in Contai, Indgo and <i>rabbi</i> doing well. Prospects of silk cocoons improved. Prices of rice — <div style="float: right; text-align: right;"><table><tr><td>Srs.</td><td></td></tr><tr><td>Sudder</td><td>16</td></tr><tr><td>Contai</td><td>26 (new)</td></tr><tr><td>Tamluk</td><td>18</td></tr><tr><td>Ghatal</td><td>19</td></tr></table> } per rupee.</div>	Srs.		Sudder	16	Contai	26 (new)	Tamluk	18	Ghatal	19
Srs.													
Sudder	16												
Contai	26 (new)												
Tamluk	18												
Ghatal	19												
5	Hooghly .. 1, '90	Nil	Weather—cold. Harvesting of paddy over. Outturn of <i>rabbi</i> very hopeful.										
	Serampore .. 0.36		Prices of common rice —										
	Jehanabad .. 0.45		<div style="float: right; text-align: right;"><table><tr><td>Srs.</td><td></td></tr><tr><td>Sudder and Serampore</td><td>12½</td></tr><tr><td>Jehanabad</td><td>17½</td></tr></table> } per rupee.</div>	Srs.		Sudder and Serampore	12½	Jehanabad	17½				
Srs.													
Sudder and Serampore	12½												
Jehanabad	17½												
	Howrah .. 1, '90	Nil	Weather—cold. Prospects of crops good. Common rice sold at Howrah at 12½ seers per rupee during the week.										
Central Districts.													
6	24-Pargahs Feb. 1, '90	Nil	Weather—cool. Prospects good. Yield of <i>amua</i> has averaged 16 annas. <i>Rabbi</i> crops doing well. Price of ordinary rice 16 seers per rupee.										
7	Nudda .. 1, '90	Nil	Weather—cold. <i>Moong</i> , <i>katai</i> , mustard, and sugarcane harvested with fair outturn. Other winter crops doing well.										
	Ranaghat .. 0.30												
8	Khoolna .. 1, '90	Nil	Weather—seasonable. <i>Amua</i> harvest nearly completed; outturn good. Prospects of <i>boro</i> and <i>rabbi</i> crops satisfactory.										
	Bagirhat .. 0.98												
	Batkhira .. 2.03												
9	Jessore .. 1, '90	Nil	Weather—very cold. The rainfall of the week will be beneficial to the spring crops. Mustard being gathered. Price of rice stationary.										
	Magura .. 0.17												
	Narail .. 2.61												
	Bongong .. 1.63												
10	Moorsheadabad .. 1, '90	Nil	Weather—bright and cold. Wind N.W. All the <i>rabbi</i> crops on the ground are doing well. <i>Haimanti dhan</i> nearly all harvested.										
11	Dinagpur .. 1, '90	Nil	Weather—getting cooler. Outturn of <i>amua</i> is estimated at 16 annas. Prospect of mustard not favourable. Pressing of sugarcane continues.										
	Thakurgaon .. 0.34												
12	Rajshahye .. 1, '90	Nil	Weather—cold with fresh breeze. Condition of spring crops good. Harvesting of <i>amua</i> nearly over with good outturn. Sugarcane being reaped all over the district. Ganja and tobacco at Nowgong in good condition. Common rice sold at 16 seers 9 chittacks per rupee.										
13	Rungpur .. 1, '90	Nil	Weather—seasonable. <i>Amua</i> rice is estimated to have yielded a 15-anna crop. Tobacco is flourishing. Sugarcane is being cut and crushed, and mustard gathered with a fair outturn.										
	Korigram .. 0.66												
	Nilphamari .. 0.80												
14	Bogra .. 1, '90	Nil	Weather—very cold; days somewhat cloudy. Reaping of <i>amua</i> almost finished; probably not more than one anna remaining to be cut. Other crops also being gathered. Common rice is being sold at head-quarters at 21 seers per rupee.										
	Sherpur .. 0.01												
	Nowkhilla .. 0.34												
15	Pabna .. 1, '90	Nil	Weather—fine and cool. <i>Amua</i> outturn estimated at 13 annas. Mustard and tobacco expected to yield 12 annas. Sugarcane will not be above 8 annas. Prices slightly lower.										
16	Darjeeling .. 1, '90	Nil	Weather—very cold and bright. Crops doing well and prospects generally good.										
17	Jalpigore .. 1, '90	Nil	Weather—cold. Cutting of <i>haimanti</i> paddy completed; 14 annas outturn obtained. Winter crops doing well. Some damage to tobacco reported from Falacutta owing to recent hailstorm. Prices stationary.										

No.	District and date of return.	Rainfall at Sudder Station in inches.	Character of the weather and state and prospects of the crops.
BENGAL.—concluded.			
<i>Eastern Districts.</i>			
Dacca Divn.	18 Dacca Feb. 1, '90	2.54	Weather—very cold. Heavy rain in the Sudder subdivision. Sowing of <i>boro</i> paddy nearly completed. Mustard and pulses being gathered. Rain has done good to the standing crops. Fodder is available. No special change in the prices of food-grains. Common rice sold at from 13 to 16 seers per rupee.
	19 Comradpur .. 1, '90	Nil	Weather—colder and clearer. Produce of date trees below average owing to floods of rainy season. <i>Boro</i> rice being sown on chura. Sugarcane being cut. Prospects of cold-weather crops on the ground fair. Tillage for early rice and jute progressing.
	20 Backergunge .. 1, '90	Nil	Weather—cool with foggy mornings. Prospects of crops good. Harvesting of <i>amra</i> nearly completed; outturn estimated at 16 annas. Common new rice selling at 16 seers per rupee.
	21 Mymensingh .. 1, '90	0.22	Weather—very cold. Prospects of crops good. Common rice sold at 14 seers per rupee. Transplantation of <i>boro dhan</i> continues.
Chittagong Divn.	22 Chittagong .. 1, '90	Nil	Weather—seasonable. State of miscellaneous crops good.
	23 Noakholly .. 1, '90	0.02	Weather—seasonable. State of <i>rubbi</i> crops good. Rain has done good to them. Price of rice stationary.
	24 Tipperah .. 1, '90	0.35	Weather—seasonable. Winter crops doing well. Transplantation of <i>boro dhan</i> still going on.
	25 Chittagong Hill Tracts. Jan. 31, '90	Nil	Weather—very cold and foggy up to 10 A.M. in the morning. Wind steady from N. Gathering of mustard commenced. Tobacco and chillies progressing.
BEHAR.			
Patna Divn.	Hill Tipperah Feb. 1, '90	Nil	Weather—cold. Chillies and tobacco doing well. <i>Jam</i> -cutting commenced in the hills.
	26 Patna .. 1, '90	Nil	Weather—cold. Prospects of <i>rubbi</i> continue good. A shower of rain would, however, much benefit the crops. Peas and mustard are in pods. Wheat in ear in some places. Poppy is flowering and looks well. Prices of food-grains almost stationary.
	27 Gya .. 1, '90	Nil	Weather—cold. Harvesting of paddy nearly finished. Prospects of <i>rubbi</i> and poppy favourable. Food-stocks sufficient.
	28 Shahabad .. 1, '90	Nil	Weather—very cold and bright all the week, but miller and rather cloudy to-day (1st). Cutting of peas commenced. Other <i>rubbi</i> crops and poppy doing well. Sugarcane being pressed. Prices stationary.
Bhagalpur Divn.	29 Darbhanga .. 1, '90	Nil	Weather—very cold with west wind. The late rain has greatly benefited the <i>rubbi</i> crops. Mustard is being harvested in places. Prospects of poppy continue good. Common rice selling at 19 seers per rupee.
	30 Masnherpur .. 1, '90	0.06	Weather—seasonable. All standing crops doing very well. Mustard being cut.
	Hajipur	0.05	Prospects of poppy good, except the late sowings in Hajipur.
	Sitamarhi	0.39	
Bhagalpur Divn.	31 Saran .. 1, '90	Nil	Weather—clear and cold; very seasonable with west winds. <i>Rubbi</i> prospects excellent. Poppy rather backward, but fair. Sugarcane pressing going on.
	32 Champaran .. 1, '90	Nil	Weather—cold, with passing clouds. Rainfall of the past week has been decidedly beneficial to all crops, and has caused no damage to wheat according to latest reports. Early poppy plants coming into flower. Prices stationary.
	33 Monghyr .. 1, '90	Nil	Weather—cool and cloudy at times. <i>Rubbi</i> crops doing well, but want rain, especially in the Begusarai subdivision, where the standing crops on high lands do not look very promising, and mustard has been damaged by <i>lahi</i> insects. Poppy flowering.
	34 Bhagalpur .. 1, '90	Nil	Weather—cool with west winds. Prospects of crops promising, but rain wanted for wheat. Mustard harvested; yield about 12 annas. Linseed flowering and weather favourable.
Bhagalpur Divn.	35 Purneah .. 1, '90	Nil	Weather—cold. Mustard still being harvested with good outturn. Tobacco and other <i>rubbi</i> crops have benefited, especially in Kishengunge, from recent rain. Tobacco a good crop. Ploughing going on.
	Kishengunge (on 24th Jan.) Arrarrah (ditto)	1.30 0.14	
	36 Maidah Feb. 1, '90	Nil	Weather—somewhat cooler. Gathering of <i>kulai</i> and mustard continues; in thina Kharba it is just over. Other <i>rubbi</i> crops (wheat, barley, gram, &c.) doing well, but require rain. Transplantation of <i>boro</i> paddy going on. Common rice selling at an average of 17 seers per rupee.
Bhagalpur Divn.	37 Sonthal Pergas. .. 1, '90	Nil	Weather—very cold and dry; warm in the day time. <i>Rubbi</i> crops doing well. Mustard is a short crop in Pakour, estimated at 8 annas. Mungoes are in blossom.

No.	District and date of return.	Rainfall at Sudder Station in inches.	Character of the weather and state and prospects of the crops.
ORISSA.			
Orissa Divn.	38 Cuttack Feb. 1, '90	Nil	Weather—seasonable. Estimated outturn of <i>guru sarad</i> is as follows :— Jajpore 17 annas. Kendrapara 12 " Sudder 13 " On the whole a 14-anna crop has been reaped over the whole district.
	39 Pooree ... ..	...	Report not received.
	40 Balasore .. 1, '90	Nil	Weather—unusually cold. Outturn of <i>guru rice</i> estimated at 14 annas in the Bhadruck subdivision and 11 annas in the Sudder subdivision. Outturn of <i>rubbi</i> crops averages generally about 12 annas.
CHOTA NAGPORE.			
<i>South-West Frontier Agency.</i>			
Chota Nagpore Divn.	41 Hazaribagh Feb. 1, '90	Nil	Weather—seasonable. Crops in good condition everywhere.
	42 Lohardugga .. 1, '90	Nil	Weather—seasonable; mornings very chilly. Prospects of <i>rubbi</i> crops good at head-quarters. In Palamow they are somewhat affected by want of rain.
	43 Singhbhum .. 1, '90	Nil	Weather—seasonable. Prospects of winter crops favourable. Prices stationary.
	44 Manbhum .. 1, '90	0.06	Weather—cold. Mustard fully harvested, with 16 annas outturn. Sugar-cane being pressed; outturn about 10 to 12 annas. <i>Rubbi</i> crops doing well; probable outturn 14 annas. Price of rice falling.

Published for general information.

CALCUTTA; REVENUE DEPT.,
The 4th February, 1890.

P. NOLAN,
Secy. to the Govt. of Bengal.

**Results of the Meteorological Observations taken at the Alipore Observatory from
26th January to 1st February 1890.**

Month.	Date.	Maximum in sun.	Number of hours of bright sunshine.	Mean pressure barometer at 32° Fahr.	TEMPERATURE.				HYGROMETRY.				WIND.		Miles recorded.	Rain.	WEATHER.
					Mean.	Maximum.	Range.	Minimum.	Mean wet bulb.	Vapour tension.	Dew point.	Humidity.	Prevailing direction.				
1890.		°		Inches.	°	°	°	°	°	Inches.	°	%			Inches.		
Jan	26th	129.5	9.6	29.931	63.9	71.6	16.4	55.2	57.2	0.384	51.5	66	NNW and NNE	75	Nil	Clear, P.	
	27th	130.4	9.3	29.932	60.5	71.3	20.9	50.4	52.9	304	45.4	60	N by E, WNW and calm.	47	..	Clear, P.	
"	28th	131.7	9.0	29.976	60.1	73.4	25.8	47.6	52.9	306	45.7	63	NNW and calm	42	..	Chiefly clear P.	
	29th	132.3	9.4	30.041	61.9	73.3	22.9	50.4	52.7	277	42.9	53	NNE and NNW	110	..	Clear, P.	
	30th	131.0	9.5	30.11	63.8	75.8	23.2	52.6	55.9	340	48.8	60	N and NNE	81	..	Clear, P.	
	31st	130.2	9.0	30.042	64.2	76.2	22.7	53.5	57.0	370	50.6	69	NNE and N	6	..	Clear, P.	
Feb	1st	132.6	9.4	30.068	64.1	76.7	24.7	52.0	55.9	338	48.2	60	NNE and N by W	53	..	Clear, P.	

The mean pressure of the seven days 30.000
The average pressure of the corresponding period for 24 years, S.-G.'s Office ... 29.994

The total number of hours of bright sunshine 66.4
The maximum possible number of hours of sunshine 77.4

The mean temperature of the seven days 62.6
The average temperature of the corresponding period for 24 years, S.-G.'s Office 68.8
The extreme variation of temperature 29.1
The maximum temperature 76.7

The highest velocity of the wind in one hour 10

The highest pressure of wind on one square foot Not measurable.

The mean relative humidity 62

The average relative humidity of the corresponding period for 24 years, S.-G.'s Office 71

The total fall of rain from 26th January to 1st February 1890 Nil
The average fall of the corresponding period for 24 years, S.-G.'s Office ... 0.26
The total fall from 1st January to 1st February 1890 0.77
The average fall of the corresponding period for 24 years, S.-G.'s Office ... 0.45

The mean pressure, temperature, &c., are deduced from the traces of the Barograph and Thermograph.
The maximum and minimum temperatures are obtained from self-registering thermometers. All the thermometers are verified, and the readings have been corrected to a standard constructed and verified at the Kew Observatory. They are exposed under a thatched shed open at the sides, and are suspended four feet above the ground.

The barometer readings are corrected approximately to those of the standard, Newman's No 86, formerly at the Surveyor-General's Office.

The hygrometric elements are obtained from Tables III, IV, and V of the official tables computed in the Meteorological Office, and based on Regnault's modifications of August's formula.

The directions and the movement of the wind are taken from the trace of a Bockley's anemograph.

The mouth of the rain-gauge is one foot above the ground

and

C. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, GOVT. OF INDIA;

Calcutta, the 3rd February 1890.

Meteorological Report of the Province of Ber

			STATION OBSERVATIONS.														
			AIR PRESSURE.			WIND.		TEMPERATURE.									
Distance.	Representative station.		Mean barometric height, 8 A.M.	Mean reduced to sea-level.	Variation from mean.	Prevailing direction.	Mean wind velocity.	Highest during week.	Date.	Lowest during week.	Date.	Mean maximum temperature.	Mean minimum temperature of week.	Mean daily temperature of week.	Variation from normal mean of week.		
URMA.	Poorce	Poorce	30.002	30.015	—	N	204	84°	25th Jan.	58°	28th Jan.	80°	60°	68°	—		
	Poorce	Gopalpore	30.002	30.015	—0.010	NNW	205	84°	26th Jan.	58°	28th Jan.	79°	60°	70°	—1°		
	Poorce	False Point	30.006	30.028	—0.043	NW	202	83°	25th Jan.	58°	27th Jan.	76°	54°	65°	—4°		
	Cuttack	Cuttack	30.059	30.045	—0.009	NW	31	88°	25th Jan.	50°	28th Jan.	82°	55°	68°	—4°		
	Balasore	Balasore	30.057	30.040	—0.016	NNW	124.7	80°	25th Jan.	44°	28th Jan.	79°	51°	65°	—3°		
	South-West Midnapore	Saugor Island	30.003	30.030	—0.034	N & NNE	295	81°	25th Jan.	51°	28th Jan.	75°	56°	65°	—2°		
	Midnapore	Midnapore	30.053	30.043	—0.003	N	33.3	87°	25th Jan.	40°	28th Jan.	79°	51°	65°	—2°		
	St. Pergunnah	Calcutta	30.006	30.031	—0.015	Northerly	80°	81°	25th Jan.	47°	28th Jan.	74°	53°	66°	—3°		
	Howrah	Burdwan	29.981	30.038	—0.032	North-westerly.	66°	85°	25th to 28th Jan.	40°	28th Jan.	81°	51°	66°	—0°		
	Hooghly	Hankora	29.701	30.020	—0.054	Westerly	65°	80°	25th Jan.	45°	27th Jan.	77°	50°	64°	—2°		
SOUTH-WEST BUREAU.	Burdwan	Burdwan	29.981	30.038	—0.032	North-westerly.	66°	85°	25th to 28th Jan.	40°	28th Jan.	81°	51°	66°	—0°		
	Burdwan	Hankora	29.701	30.020	—0.054	NW	84°	85°	25th Jan.	40°	29th Jan.	78°	50°	64°	—2°		
	Burdwan	Ranagunge	29.701	30.056	—0.019	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
EAST BUREAU.	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
NORTH BUREAU.	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
SOUTH BUREAU.	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
CALCUTTA NORTH BUREAU.	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
CALCUTTA SOUTH BUREAU.	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		
	Burdwan	Burdwan	29.981	30.038	—0.032	NW	65°	81°	25th Jan.	47°	28th Jan.	76°	50°	63°	—2°		

Explanation.—Summary.—The normal means of air pressure and temperature are the arithmetical averages or means of the readings during the same period for the years 1871-80. The humidity of the atmosphere is expressed at percentage saturated air being presented by 100. A clear sky is denoted by 0 and an overcast sky by 10. The mean of the observations, means or average of the period in that district determined from the returns sent in by the corresponding stations for the period in question during the year 1889. A rainy day is one on which at least hundredth of an inch fall.

for the week ending Friday, the 31st of January 1890.

DISTRICT OBSERVATIONS.															Representative station.	DISTRICT.	METEOROLOGICAL DIVISION.
Average humidity at 5 A.M.	Average cloud amount at 5 A.M. for week.	Rainfall of week at observing station.	OF WEEK.		RAINFALL.												
			Mean for district.	Normal mean.	Since 1st of month.			Since 15th May 1889.			Average number of rainy days.	Normal number of rainy days.					
					Mean for district.	Normal mean.	Variation.	Mean for district.	Normal mean.	Variation.							
73	1.5	0.10	0.00	0.17	0.0	0.31	-0.25	74.08	55.44	+18.64	0.5	0.4	Poorer	Poorer	Orissa.		
72	1.1	Nil											Nepalpora				
75	1.7	0.15											Pato Point				
63	1.7	Nil	0.15	0.20	0.15	0.36	-0.21	60.90	51.01	+9.89	0.4	0.4	Cuttack	Cuttack	Orissa.		
67	0	Nil	0.07	0.25	0.07	0.44	-0.37	40.96	53.04	-12.08	0.2	0.4	Balasore	Balasore			
61	1.3	Nil	0.14	0.20	0.14	0.43	-0.29	58.57	62.54	-3.97	0.7	0.4	Maunor Island	South-West Midnapore			
53	0.3	Nil	0.10	0.18	0.10	0.40	-0.30	40.39	5.50	-34.89	0.7	0.5	Midnapore	Midnapore	Orissa.		
75	0.9	0.77	0.72	0.18	0.72	0.50	+0.22	51.10	51.04	+0.06	1.0	0.5	Calcutta	24-Pargunnahs			
58	0.3	0.06	0.02	0.17	0.00	0.38	-0.38	43.80	46.60	-2.80	0.3	0.5	Burdwan	Howrah			
63	0	0.06	0.03	0.20	0.00	0.40	-0.40	55.01	52.09	+2.92	0.3	0.5	Bankura	Hooghly	Orissa.		
55	0	0.02	0.01	0.12	0.02	0.44	-0.42	52.10	51.62	+0.48	0.2	0.4	Raneegunge	West Burdwan			
64	0	Nil	Nil	0.07	0.02	0.44	-0.42	51.17	50.46	+0.71	0.0	0.4	Herhampore	Moorsheadabad			
76	1.4	Nil	0.06	0.14	0.12	0.54	-0.42	51.01	49.23	+1.78	0.2	0.4	Krishnaghar	Nuddea	Orissa.		
60	1.6	1.55	1.21	0.18	1.36	0.10	+0.26	51.70	53.17	-1.47	1.0	0.5	Jessore	Jessore			
65	1.5	0.76	0.33	0.23	0.33	0.00	-0.30	100.36	115.71	-15.35	0.5	0.5	Chittagong	Khoulia	Orissa.		
64	1.1	3.01	0.33	0.22	0.40	0.07	-0.18	78.31	70.00	+8.31	0.8	0.5	Chittagong	Chittagong Hill Tracts			
61	0.4	0.15	0.17	0.10	0.24	0.72	-0.10	90.52	100.55	-10.03	1.0	0.5	Barrisal	Backergunge	Orissa.		
60	1.4	0.21	0.45	0.17	1.00	0.42	+1.80	61.22	55.43	+5.79	0.7	0.5	Noakholly	Noakholly			
72	1.3	1.10	0.03	0.18	1.37	0.41	+0.90	70.00	50.04	+19.96	1.0	0.5	Furroadpore	Furroadpore	Orissa.		
65	1.0	0.00	0.28	0.22	1.17	0.07	+0.80	50.02	50.40	-0.38	1.0	0.5	Dacca	Dacca			
60	1.0	0.24	0.04	0.1	1.15	0.38	+0.77	55.75	67.50	-11.75	1.0	0.4	Commillah	Tipperah	Orissa.		
61	0	0.63	0.30	0.09	0.81	0.50	+0.45	55.00	57.20	-2.20	1.0	0.5	Mymensingh	Mymensingh			
60	1.4	0.17	0.09	0.13	0.30	0.41	-0.11	55.32	53.33	+1.99	0.5	0.4	Bogra	Bogra	Orissa.		
70	0.1	Nil	Nil	0.18	0.05	0.60	-0.55	54.33	53.02	+1.31	0.0	0.4	Serajpore	Pubna			
73	0	Nil	Nil	0.12	Nil	0.48	-0.48	50.76	54.21	-3.45	0.0	0.4	Rampore	Rajshahye	Orissa.		
62	0.3	0.60	0.13	0.27	0.12	0.50	-0.44	57.40	57.10	+0.30	0.4	0.4	Maldah	Maldah			
65	0	0.11	0.21	0.10	0.71	0.60	+0.21	55.87	74.22	-18.35	0.5	0.5	Dinapore	Dinapore	Orissa.		
60	0	Nil	0.04	0.30	0.00	0.54	+0.00	117.73	111.74	+5.99	0.4	0.5	Rungpore	Rungpore			
78	5.1	0.70	0.10	0.46	0.71	0.94	-0.28	133.40	121.27	+12.13	1.0	1.0	Jalpaigore	Jalpaigore	Orissa.		
60	0	0.02	Nil	0.15	0.29	0.40	-0.20	75.00	58.43	+16.57	0.0	0.4	Darjeeling	Darjeeling Hill Tracts			
73	1.4	0.25	0.12	0.23	0.27	0.04	-0.50	44.81	43.28	+1.53	1.0	0.4	Purneah	Purneah	Orissa.		
61	0	0.45	0.03	0.28	0.41	0.05	-0.37	52.11	44.09	+8.02	1.0	0.4	North Bhagulpore	North Bhagulpore			
60	0	Nil	Nil	0.30	Nil	0.70	-0.70	40.13	42.07	-1.94	0.0	0.5	Mosufferpore	Mosufferpore	Orissa.		
60	0	Nil	Nil	0.12	Nil	0.67	-0.67	40.07	40.27	-0.20	0.0	0.5	Darbhanga	Darbhanga			
60	0	Nil	Nil	0.22	Nil	0.60	-0.60	57.07	41.38	+15.69	0.0	0.5	Mothari	Chumpanan	Orissa.		
60	0	Nil	Nil	0.18	Nil	0.38	-0.38	43.40	41.30	+2.10	0.0	0.5	Chupra	Saran			
60	0	Nil	Nil	0.07	Nil	0.37	-0.37	56.15	50.71	+5.44	0.0	0.4	Dehrer	Shahabad	Orissa.		
60	0	Nil	Nil	0.10	Nil	0.63	-0.63	40.03	50.74	-10.71	0.0	0.5	Buxar	Gya			
60	0	Nil	Nil	0.22	Nil	0.60	-0.60	43.43	43.04	+0.39	0.0	0.5	Arrah	Patna	Orissa.		
60	0	Nil	Nil	0.07	Nil	0.37	-0.37	56.15	50.71	+5.44	0.0	0.4	Gya	Gya			
60	0	Nil	Nil	0.10	Nil	0.63	-0.63	40.03	50.74	-10.71	0.0	0.5	Bankipore	Patna	Orissa.		
60	0	Nil	Nil	0.22	Nil	0.60	-0.60	43.43	43.04	+0.39	0.0	0.5	Bhagulpore	South Bhagulpore			
60	0	Nil	Nil	0.07	Nil	0.37	-0.37	56.15	50.71	+5.44	0.0	0.4	Monahyr	Monahyr	Orissa.		
60	0	Nil	Nil	0.10	Nil	0.63	-0.63	40.03	50.74	-10.71	0.0	0.5	Boomka	South Pargunnahs			
60	0	Nil	Nil	0.22	Nil	0.60	-0.60	43.43	43.04	+0.39	0.0	0.5	Hasaribagh	Hasaribagh	Orissa.		
60	0	Nil	Nil	0.07	Nil	0.37	-0.37	56.15	50.71	+5.44	0.0	0.4	Ranchi	Lohardugga			
60	0	0.01	Nil	0.20	Nil	0.60	-0.60	43.43	40.04	-3.39	0.5	0.4		Munihoom			
50	0.0	Nil	Nil	0.28	Nil	0.72	-0.72	48.70	61.80	-13.10	0.0	0.5	Chyabassa	Singbhoon			

The variations are negative when the mean for the week is less than the corresponding normal mean, and positive when greater.
 The average cloud amount represents the part of the sky covered, the whole sky being denoted by 10. Under the head District observations of rainfall the normal means are given for the week ending Friday, the 31st of January 1890.
 The means of the district are the numerical average of the rainfall returns received in the district, i.e., from total rainfall at the subdivisional stations.

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 31st of January 1890.

Meteorological division.	District.	Station.	RAINFALL.							TOTAL		Total rain- fall since 1st of month.	Average total rain- fall from 1st of month.	Total rain- fall since 15th May 1899.	Average rainfall from 15th May to date.	
			Saturday, 25th January.	Sunday, 26th January.	Monday, 27th January.	Tuesday, 28th January.	Wednesday, 29th January.	Thursday, 30th January.	Friday, 31st January.	Number of rainy days.	of rainfall week.					
CENTRAL	Pooné	Gooree	0.04							1	0.04	0.04	0.24	80.71	51.32	
		Khurda								Nil	Nil	Nil	0.24	79.57	50.50	
		Banpur								Nil	Nil	Nil	0.00	81.50	49.01	
		False Point	0.15							Nil	0.15	0.30	0.45	77.00	53.18	
		Gop Pipli								Nil	Nil	Nil	?	?	?	
	Cuttack	Jaratsingapore	0.52							1	0.52	0.52	0.52	74.40	47.08	
		Banki								Nil	Nil	Nil	0.14	52.43	49.55	
		Cuttack								Nil	Nil	Nil	0.33	75.18	50.35	
		Kendrapara	0.21							1	0.21	0.21	0.44	72.24	50.25	
		Jajpore Bharmasala Satiposa								Nil	Nil	Nil	0.43	67.04	53.40	
	Balasore	Chandimali	0.40							1	0.40	0.40	0.51	51.01	51.07	
		Bhadrachal								Nil	Nil	Nil	0.41	57.95	51.70	
		Singh								Nil	Nil	Nil	0.06	61.05	51.13	
		Balasore								Nil	Nil	Nil	0.48	49.01	57.04	
		Jonesore Harapada								Nil	Nil	Nil	0.53	59.59	51.99	
SOUTH-WEST MAHAL.	Midnapore	Cuttack	0.05							1	0.05	0.05	0.20	55.14	51.37	
		Saugor Island								Nil	Nil	Nil	0.37	59.74	57.79	
		Imphool	0.20							1	0.20	0.20	0.39	49.08	51.30	
		Madnapore								Nil	Nil	Nil	0.39	49.08	48.00	
		Ghatol	0.11							1	0.11	0.11	0.50	45.96	51.54	
	Kutubkhali	Kutubkhali	0.19							1	0.19	0.19	0.19	59.84	?	
		Bhadrachal								Nil	Nil	Nil	?	5.72	?	
		Garbatia								Nil	Nil	Nil	?	60.29	?	
		Diamond Harbour	Diamond Har- bour	0.14							1	0.14	0.14	0.63	53.79	54.54
			Canning Town	0.05							1	0.05	0.05	?	57.83	?
	Alipore Jail		1.00							1	1.00	1.00	0.03	55.87	55.83	
	Batapore		0.51							1	0.51	0.51	0.40	52.12	49.00	
	Dum Dum		1.00							1	1.00	1.00	0.01	58.71	49.57	
	Howrah	Howrah	1.40							1	1.40	1.40	0.45	53.41	56.14	
		Howrah	0.22							1	0.22	0.22	0.58	59.64	57.01	
Malabar		0.40							1	0.40	0.40	0.50	55.04	52.00		
Hooghly		Serampore	0.36							1	0.36	0.36	0.43	55.01	50.15	
		Hooghly	0.61							1	0.61	0.61	0.38	57.53	49.17	
	Jatashah	0.45							1	0.45	0.45	0.39	41.41	53.00		
	Bardwan	Chins								Nil	Nil	Nil	0.39	41.82	44.53	
		Bardwan	0.06							1	0.06	0.16	0.30	47.25	47.83	
Chins									Nil	Nil	Nil	0.44	45.11	47.79		
Bansdanga		0.05							1	0.05	0.05	0.33	50.90	49.01		
Medinipur									Nil	Nil	Nil	?	53.00	?		
Bankura	Bankura	0.07							1	0.07	0.07	0.54	54.86	51.40		
	Bansdanga								Nil	Nil	Nil	0.35	57.40	51.30		
	Malda								Nil	Nil	Nil	0.11	49.81	51.50		
	Khatra								Nil	Nil	Nil	0.45	53.91	54.21		
	Jalpaiguri								Nil	Nil	Nil	?	45.14	?		
	Ajodhya								Nil	Nil	Nil	?	49.50	?		
	Jalpaiguri								Nil	Nil	Nil	?	49.64	?		
	Chandpur								Nil	Nil	Nil	?	59.17	?		
	Kalpaiguri								Nil	Nil	Nil	?	58.35	?		
	Chandpur	0.11							1	0.11	0.11	?	54.64	?		
Burdwan	Mr. Scory								Nil	Nil	Nil	0.44	59.06	51.71		
	Burdwan								Nil	Nil	Nil	0.50	47.07	54.30		
	Burdwan								Nil	Nil	Nil	0.53	47.70	51.54		
	Burdwan								Nil	Nil	Nil	0.07	53.00	?		
	Burdwan								Nil	Nil	Nil	?	53.10	?		
Nadwa	Bankura	0.30							1	0.30	0.30	0.45	50.10	47.00		
	Bankura								Nil	Nil	Nil	0.50	43.05	46.04		
	Bankura								Nil	Nil	Nil	0.50	40.00	50.30		
	Bankura								Nil	Nil	Nil	0.10	50.10	47.04		
Khosia	Bankura								Nil	Nil	Nil	0.15	50.05	47.04		
	Bankura								1	0.01	0.01	0.40	54.84	55.10		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
Jessore	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
Moorshedabad	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
Burdwan	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
Burdwan	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		
	Bankura								1	0.01	1.01	0.01	50.40	51.50		

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 31st of January 1890—contd.

Division.	District.	Station.	RAINFALL							TOTAL		Total rain-fall since 1st of month.	Average total rain-fall from 1st of month.	Total rain-fall since 15th May 1889.	Average rainfall from 15th May to date.	
			Saturday, 25th January 1890.	Sunday, 26th January.	Monday, 27th January.	Tuesday, 28th January.	Wednesday, 29th January.	Thursday, 30th January.	Friday, 31st January.	Number of rainy days.	of Rainfall week.					
BENGAL	Noakhali	Gouradadi	0.23							Nil	Nil	Nil	?	61.31	?	
		Naikhat	0.12	0.02						2	0.14	0.41	0.61	102.68	107.84	
		Harishpore	0.36							1	0.36	0.65	0.81	83.92	100.72	
	Faridpur	Madari pur	1.13							1	1.13	2.12	0.31	65.98	56.33	
		Furridpur	0.21							Nil	Nil	1.90	0.34	65.90	56.30	
		Goulundo								1	0.21	1.76	0.38	66.95	56.95	
	Dacca	Munshir-oge	0.52							1	0.52	1.18	0.52	77.51	70.04	
		Dacca	2.54							1	2.54	2.76	0.34	70.45	68.34	
		Naraingonj	0.34							1	0.34	0.78	0.35	81.14	69.78	
	Hill Tipperah	Manikgonj	1.17							1	1.17	1.08	0.43	60.07	50.09	
		Jaydebpore	0.78							1	0.78	1.04	?	62.45	?	
BENGAL		Tipperah	Agartala	0.12							1	0.12	0.30	0.64	64.38	61.53
	Comilla		0.35							1	0.35	0.80	0.68	69.07	70.11	
	Chandpur		0.01							1	0.01	1.15	0.64	66.07	70.79	
	Lalmonirhat	Brakmunda	1.25							1	1.25	2.44	0.70	63.12	61.71	
		Manchandra	0.30							1	0.30	0.68	?	60.83	?	
		Manchandra	1.80							1	1.80	1.80	?	32.30	?	
	Lalmonirhat	Naogaon	0.72							1	0.72	1.44	?	55.74	?	
		Kasba	0.09							Nil	Nil	Nil	?	62.44	?	
		Lalmonirhat	0.09							1	0.09	0.39	?	60.18	?	
	Mymensingh	Kishoreganj	1.24							1	1.24	1.24	0.59	70.90	70.12	
BENGAL		Atia (Tangai)	0.85							1	0.85	1.09	0.45	62.08	35.41	
		Mymensingh	0.22							1	0.22	1.35	0.55	97.93	73.98	
BENGAL	Jamtara	Jamtara	0.43							1	0.43	0.67	0.45	80.01	66.16	
		Narail	0.83							1	0.83	0.65	0.13	126.47	72.74	
		Shibpur								Nil	Nil	Nil	?	57.43	?	
	Shariatpur	Shariatpur								Nil	Nil	0.30	?	120.28	?	
		Shariatpur	0.44							1	0.44	1.08	?	89.17	?	
		Dumuria								Nil	Nil	0.77	?	57.08	?	
	Pabna	Pabna								Nil	Nil	0.33	0.35	50.20	53.64	
		Serajganj	0.17							1	0.17	0.25	0.46	60.61	52.63	
		Bogra	Shariatpur	0.01							1	0.01	0.01	0.14	62.07	57.18
	Nowkhila		0.31							1	0.31	1.48	0.38	63.44	51.20	
	Bogra		0.09							1	0.09	0.70	0.41	71.33	60.50	
Rajshahi	Panchabhi	0.70							1	0.70	1.02	0.52	66.08	60.72		
	Rajshahi								Nil	Nil	0.14	0.30	46.94	52.91		
	Nalbari								Nil	Nil	Nil	0.01	54.94	54.94		
Naogaon	Naogaon								Nil	Nil	Nil	0.78	57.87	51.42		
	Lalpur								Nil	Nil	Nil	?	30.72	?		
	Wanda								Nil	Nil	Nil	?	45.27	?		
Maldah	Maldah								Nil	Nil	Nil	0.43	50.83	51.72		
	BENGAL		Chanchal								Nil	Nil	0.31	28.96	50.71	
			Gajal								Nil	Nil	Nil	?	39.70	?
Munshiganj	Munshiganj								Nil	Nil	Nil	?	51.77	?		
	Munshiganj								Nil	Nil	Nil	0.57	53.65	56.39		
	Churaman								Nil	Nil	Nil	0.66	51.82	52.58		
Munshiganj	Munshiganj	0.12							1	0.12	0.12	0.57	52.37	52.31		
	Munshiganj	0.40							1	0.40	0.40	0.40	68.33	60.42		
	Munshiganj								Nil	Nil	0.01	0.02	61.29	51.52		
Rangpur	Thakurgaon								Nil	Nil	0.34	?	47.81	?		
	Rangpur	0.61							1	0.61	0.84	0.57	88.39	61.02		
	BENGAL		(Gyandak)	0.20							1	0.20	0.65	0.50	74.08	74.55
Rangpur	Rangpur								Nil	Nil	0.65	0.51	81.02	73.31		
	Rangpur								Nil	Nil	0.60	0.50	85.40	85.40		
	Rangpur								Nil	Nil	0.10	?	79.10	?		
Jaipur	Jaipur								Nil	Nil	0.18	0.55	123.45	112.06		
	Alipore								Nil	Nil	0.40	?	119.55	?		
	Pallabpore								Nil	Nil	1.02	?	123.23	?		
Cooch Behar	Phulpur								Nil	Nil	0.71	?	120.22	?		
	Phulpur	0.16							1	0.16	0.83	0.07	94.81	86.30		
	Cooch Behar								Nil	Nil	0.26	0.44	123.39	118.50		
Darjeeling	Muktagach								1	0.03	1.03	0.65	122.40	100.74		
	Muktagach								Nil	Nil	0.40	0.15	118.03	111.64		
	Muktagach	0.03	0.06						2	0.07	1.28	1.14	102.57	102.85		
Darjeeling	Teesta	0.24							1	0.24	0.31	0.00	121.02	105.40		
	Teesta								Nil	Nil	0.40	0.05	128.27	108.72		
	Teesta	0.43							1	0.43	0.70	1.31	92.15	83.97		
Purnea	Kurseong								Nil	Nil	1.00	?	170.23	?		
	Purnea								Nil	Nil	1.30	0.02	103.67	70.12		
	Purnea								Nil	Nil	0.14	0.42	70.75	54.64		
North Bhatgaon	Arrah								Nil	Nil	0.04	0.40	63.47	48.60		
	BENGAL		Purnea								Nil	Nil	Nil	?	?	?
			Gondwana								Nil	Nil	Nil	?	?	?
North Bhatgaon	North Bhatgaon								Nil	Nil	0.20	0.47	60.85	40.15		
	North Bhatgaon								Nil	Nil	Nil	0.40	07.26	46.18		
	North Bhatgaon								Nil	Nil	0.31	?	88.10	?		
Dumraon	Dumraon	0.13							1	0.13	0.13	0.05	42.57	43.23		
	Dumraon	0.23							1	0.23	0.28	0.22	50.24	45.86		
	Dumraon	0.4							1	0.04	0.45	0.70	63.55	45.08		
Mouharpore	Bahara								Nil	Nil	Nil	?	60.00	?		
	Bahara								Nil	Nil	Nil	?	55.84	?		
	Bahara								Nil	Nil	?	?	?	?		
BENGAL	Mouharpore	Altamash	0.6							1	0.06	0.30	0.55	55.43	43.15	
		Mouharpore	0.14							1	0.06	0.00	0.81	43.47	43.47	
		Mouharpore	0.03							1	0.03	0.05	0.05	42.57	42.57	
	Mouharpore	Pura								Nil	Nil	Nil	?	81.00	?	
		Pura								Nil	Nil	Nil	?	41.08	?	
		Pura	0.10							1	0.10	0.40	?	?	?	
	Mouharpore	Pura								Nil	Nil	0.24	?	48.14	?	
		Pura								Nil	Nil	?	?	?	?	
		Pura								Nil	Nil	?	?	?	?	

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 31st of January 1890—contd.

Meteorological Division.	District.	Station.	RAINFALL.							TOTAL.		Total rainfall since 1st of month.	Average total rainfall from 1st of month.	Total rainfall since 1st of May 1889.	Average rainfall from 1st of May 1889.
			Saturday, 25th January.	Sunday, 26th January.	Monday, 27th January.	Tuesday, 28th January.	Wednesday, 29th January.	Thursday, 30th January.	Friday, 31st January.	Number of rainy days.	Rainfall in inch.				
NORTH BENGAL—continued.	Champana	Mothbari	0.00							Nil	Nil	0.54	0.54	77.33	
		Bhatia								Nil	Nil	0.28	0.28	32.57	
		Burkura								Nil	Nil	0.31	0.31	70.24	
SOUTH BENGAL	Banga	Gopalgunge								Nil	Nil	Nil	0.00	25.68	
		Chapra								Nil	Nil	Nil	0.00	41.20	
		Chapra								Nil	Nil	Nil	0.00	40.76	
	Bhadrabad	Bhatia								Nil	Nil	Nil	0.00	67.46	
		Bhatia								Nil	Nil	Nil	0.00	4.66	
		Bhatia								Nil	Nil	Nil	0.00	84.10	
		Bhatia								Nil	Nil	Nil	0.00	59.61	
		Bhatia								Nil	Nil	Nil	0.00	47.00	
		Bhatia								Nil	Nil	Nil	0.00	?	
	Gya	Aurangabad								Nil	Nil	Nil	0.00	35.42	
		Gya								Nil	Nil	Nil	0.00	39.76	
		Jehanabad								Nil	Nil	Nil	0.70	39.59	
		Jehanabad								Nil	Nil	Nil	0.71	31.40	
		Jehanabad								Nil	Nil	Nil	?	24.31	
		Jehanabad								Nil	Nil	Nil	?	30.00	
		Jehanabad								Nil	Nil	Nil	?	79.20	
		Jehanabad								Nil	Nil	Nil	?	17.92	
	Patna	Patna								Nil	Nil	Nil	0.00	31.60	
		Patna								Nil	Nil	Nil	0.00	45.53	
		Patna								Nil	Nil	Nil	0.67	41.06	
		Patna								Nil	Nil	Nil	0.66	35.81	
		Patna								Nil	Nil	Nil	?	4.21	
	Monghyr	Begumbari								Nil	Nil	Nil	0.00	47.02	
		Begumbari								Nil	Nil	Nil	0.00	41.67	
		Begumbari								Nil	Nil	Nil	0.00	30.48	
		Begumbari								Nil	Nil	Nil	?	50.10	
		Begumbari								Nil	Nil	Nil	?	43.31	
	South Bhagalpore	Bhagalpore								Nil	Nil	Nil	0.00	45.00	
		Bhagalpore								Nil	Nil	Nil	0.37	38.34	
		Bhagalpore								Nil	Nil	Nil	?	44.77	
	South Patna	Rajmehal								Nil	Nil	Nil	0.10	50.00	
		Rajmehal								Nil	Nil	Nil	0.30	40.00	
		Rajmehal								Nil	Nil	Nil	0.25	38.50	
		Rajmehal								Nil	Nil	Nil	0.02	50.77	
		Rajmehal								Nil	Nil	Nil	0.00	40.00	
		Rajmehal								Nil	Nil	Nil	0.40	45.21	
		Rajmehal								Nil	Nil	Nil	?	40.00	
		Rajmehal								Nil	Nil	Nil	?	65.87	
CENTRAL AND SOUTH BENGAL.	Hemachal	Poonam								Nil	Nil	Nil	0.30	35.90	
		Poonam								Nil	Nil	Nil	0.58	40.10	
		Poonam								Nil	Nil	Nil	0.51	30.24	
		Poonam								Nil	Nil	Nil	0.83	?	
		Poonam								Nil	Nil	Nil	0.51	43.00	
		Poonam								Nil	Nil	Nil	?	31.00	
		Poonam								Nil	Nil	Nil	?	40.00	
		Poonam								Nil	Nil	Nil	?	39.35	
		Poonam								Nil	Nil	Nil	?	?	
		Poonam								Nil	Nil	Nil	?	?	
	Lohardugga	Lohardugga								Nil	Nil	Nil	0.50	45.24	
		Lohardugga								Nil	Nil	Nil	0.50	50.01	
		Lohardugga								Nil	Nil	Nil	0.78	34.06	
		Lohardugga								Nil	Nil	Nil	?	33.00	
		Lohardugga								Nil	Nil	Nil	?	41.00	
	Singbhoon	Christman								Nil	Nil	Nil	0.72	44.77	
		Christman								Nil	Nil	Nil	?	40.00	
		Christman								Nil	Nil	Nil	?	55.70	
		Christman								Nil	Nil	Nil	?	53.00	
	Washbhoon	Pirula	0.00							1	0.00	0.06	0.06	45.53	
		Pirula								Nil	Nil	Nil	0.50	33.10	
		Pirula								Nil	Nil	Nil	?	45.91	
		Pirula								Nil	Nil	Nil	?	44.32	
		Pirula								Nil	Nil	Nil	?	31.02	

Explanation.—Indicates that no rain has fallen. If the return for any day has not been received, the corresponding space is left blank. If any of the returns are wanting, the corresponding space in the total rainfall columns are left blank.

CALCUTTA, the 4th February 1890.

**SUMMARY OF THE METEOROLOGICAL AND RAINFALL OBSERVATIONS
TAKEN IN BENGAL FOR THE WEEK ENDING FRIDAY, THE 31st
JANUARY 1890.**

It was noticed in the report for the previous week that on Friday, the 24th January, a disturbance which had originated in Northern India had commenced to pass over the province, moving in a south easterly direction. The disturbance consisted of an area of low pressure, or perhaps of two distinct areas accompanied by a feeble form of cyclonic circulation of winds. On the Friday there thus appeared to be a tendency to two distinct whirls, one of which had a centre in South Behar, while there was a second in Chutia Nagpur. On the first day of the present week, or on Saturday morning, the 25th instant, the disturbance had again moved in a south-easterly direction, and there was a distinct barometric depression lying over South-East Bengal which was accompanied by a well-marked circulation of winds the centre of which was a little to the south of Dacca. A second feeble depression also appeared to exist off the Ganjam coast, and there also was a tendency to cyclonic circulation along the coast. With the passage of these disturbed conditions through the province, numerous rain showers, in many instances accompanying local storms and in some instances with hail, occurred over the province, and on the 25th rain was generally reported in East Bengal, while very numerous stations in South-West Bengal, North Bengal, and Orissa and a few stations in North Behar also, received rain. On the 26th the disturbance had advanced over Burmah, and rather heavy rain was reported at such stations as Bassein Rangoon, etc., but in Bengal with the disappearance of the depression, weather conditions rapidly improved, and a rather strong northerly wind current set in, bringing with it a great reduction of temperature, the rapid fall of temperature being due to the fact that a moderately heavy fall of snow had been brought to the line of hills to the north and north-west of the province, which caused a cold wave of northerly winds to establish itself completely over the province. So rapid was the fall that the mean temperature of the 24 hours ending at 8 a.m. of the 26th was at many stations 5°, and at some stations as much as 9° and nearly 10° below the temperature of the previous 24 hours. At this time, therefore, the cold weather conditions set in over the province in a very pronounced form, and they have continued to exist till quite the end of the week. From the 26th, therefore, temperature has been decidedly low, while humidity was also only moderate in amount; pressure became steadily higher, and was by the middle of the week very high, though it fell somewhat towards its close. Skies were almost cloudless, and after the disappearance of the disturbed conditions absolutely no rain fell.

Pressure.—Notwithstanding the very high pressure which occurred in the middle of the week after the disappearance of the depression, the mean pressure for the period has been somewhat below the normal at almost all stations. The usual defect has not been larger than about two or three-hundredths of an inch, but at some of the stations in North Bengal it equals four-hundredths, and at Chittagong it even equals six-hundredths of an inch. These larger defects are probably connected with the depression above referred to.

Temperature.—As stated previously, fell very rapidly on the 26th, and for the remainder of the week it has been decidedly low. The mean temperature of the whole province for the week has been 2·4° below the normal, and in such districts as Chutia Nagpur and Orissa the defects have almost equalled four degrees.

The actual temperatures during the week, the range from day to night, and their variation from the normal values are best seen in the following table, where the average maximum, minimum and mean temperatures at nine typical stations in different districts of the province are given, together with the normal values. From the figures given it will be seen that the night temperatures have generally been in larger defect than those of the day, and that the mean minimum temperatures of the week have been decidedly low.

The lowest temperature recorded during the week was 37·9° at Ranchi.—

Table showing the excess or defect of the actual mean temperature from the normal for the week ending 31st January 1890.

	Normal mean maximum temperature for the week ending 31st January.	Actual mean maximum temperature for the week ending 31st January 1890.	Variation of actual mean from the normal.	Normal mean minimum temperature for the week ending 31st January.	Actual mean minimum temperature for the week ending 31st January 1890.	Variation of actual mean from the normal.	Normal mean daily temperature for the week ending 31st January.	Actual mean daily temperature for the week ending 31st January 1890.	Variation of actual mean from the normal.
Outlook	80·2	82·2	+2·0	60·3	65·5	+5·2	75·3	80·6	+5·3
Calcutta	78·4	74·7	-3·7	57·0	53·5	-3·5	67·0	64·0	-3·0
Dacca	79·4	74·0	-5·4	55·5	55·1	-0·4	67·3	64·6	-2·7
Burdwan	79·7	81·3	+1·6	55·4	51·8	-3·6	67·6	69·6	+2·0
Patna	75·3	72·0	-3·3	50·5	47·0	-3·5	61·6	58·5	-3·1
Cooch	74·3	73·0	-1·3	52·7	51·0	-1·7	64·3	62·5	-1·8
Gya	75·1	72·7	-2·4	49·0	44·4	-4·6	62·0	58·5	-3·5
Surmoo	75·1	70·1	-5·0	51·4	46·4	-5·0	62·6	56·0	-6·6
Meerabagh	73·4	70·1	-3·3	51·4	46·4	-5·0	62·6	56·0	-6·6
Darjeeling	63·8	63·3	-0·5	33·8	32·7	-1·1	48·4	47·0	-1·4

The rainfall of the week has been rather important, and the falls in South-West and East Bengal have averaged about half an inch. In other districts the falls are much smaller, and Orissa and North Bengal only average about a tenth of an inch, while in North Behar it is only about half this. Chutia Nagpur and South Behar report no rain at all.

The following table gives the summary of the temperature and rainfall data of each of the seven meteorological divisions of the province for the week ending Friday, the 31st of January 1890:—

METEOROLOGICAL DIVISIONS.	TEMPERATURE							RAINFALL								
	Highest observed during week.	Lowest observed during week.	Averages for week.			Average mean of week above or below normal mean of week.	Of week.	Rainy days.			Since 1st of month.	Since 1st of May 1889.				
			Of highest of each day.	Of lowest of each day.	Of mean for each day.			Average number in week.	Normal average number in week.	Variation.						
Average.	Normal average.	Variation.	Average.	Normal average.	Average.	Normal average.										
Orissa	86.4	66.9	79.7	53.8	67.8	3.4	0.09	0.21	-0.12	0.5	0.4	-0.1	0.09	0.27	62.10	83.99
South-West Bengal	87.3	43.8	77.2	52.1	64.6	-2.3	0.46	0.16	+0.24	0.6	0.5	+0.1	0.44	0.46	52.81	80.01
East Bengal	80.8	46.0	78.1	53.1	64.2	-1.2	0.86	0.18	+0.35	0.9	0.4	+0.5	1.07	0.55	73.06	74.26
North Bengal	79.1	41.2	73.9	48.6	61.2	-1.9	0.13	0.20	-0.07	0.4	0.4	0	0.42	0.54	73.64	70.37
North Behar	76.4	50.0	72.7	46.2	53.4	-1.7	0.04	0.21	-0.20	0.4	0.5	-0.1	0.23	0.53	57.89	48.33
South Behar	80.3	41.9	74.0	47.5	61.6	-1.0	Nil	0.15	-0.18	0.0	0.4	-0.4	Nil	0.55	44.16	46.79
Chutia Nagpur	77.3	37.9	70.9	45.5	63.2	-4.0	Nil	0.19	-0.19	0.0	0.5	-0.5	Nil	0.53	43.08	46.53

* Coyabesee and Chupra not included.

METEOROLOGICAL OFFICE, BENGAL;

A. PEDLER,

The 4th February 1890.

Meteorological Reporter to the Govt. of Bengal.

Results of the Barometrical and Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 26th January to 1st February 1890.

MONTH.	Date.	Pressure at 10 A.M. corrected and reduced to 32° Fahr.	TEMPERATURE				HYGROMETRY.				Rainfall per 24 hours.
			Daily mean.	Maximum.	Range.	Minimum.	Dry bulb at 10 A.M.	Wet bulb at 10 A.M.	Vapour tension at 10 A.M.	Dew point at 10 A.M.	
		Inches.	°	°	°	°	°	°	Inches.	°	Inches.
Jan. 1890	26th	30.021	64.7	73.4	17.5	55.9	67.6	57.2	331	47.6	Nil
"	27th	015	61.9	72.9	22.1	50.8	65.1	56.7	350	49.1	...
"	28th	070	61.4	74.4	23.0	48.4	64.6	54.7	298	44.8	...
"	29th	131	65.3	74.9	23.2	51.7	66.4	54.7	372	42.4	...
"	30th	085	64.3	77.1	25.5	51.5	66.6	57.5	357	49.7	...
"	31st	188	65.9	77.3	22.9	54.4	69.6	59.7	382	51.5	...
Feb.	1st	162	65.6	77.9	24.6	53.1	70.0	61.2	429	54.5	...

The mean 10 A.M. pressure of the seven days ... 30.085

The mean temperature of the seven days ... 63.9

The extreme variation of temperature ... 29.6

The maximum temperature ... 77.9

The mean 10 A.M. relative humidity of the seven days ... 51%

The total fall of rain from 26th January to 1st February 1890 ... Nil

The daily mean temperatures are the crude means of maximum and minimum temperatures.

C. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, INDIA;

The 3rd February 1890.

MEMORANDUM.

THE returns from the principal Municipalities in Bengal presented, during the week ending 18th January 1890, the following results:—

1. Births were registered in them at the rates of 23·1 per 1,000 of population, as opposed to very nearly the same proportion, viz., 22·8 per 1,000 in the preceding week ending 11th January, and deaths at 21·8 against 25·9 per 1,000, indicating a falling off in the registration of these events.

2. The following Municipalities returned the highest proportions of births and deaths:—

Births.			Deaths.		
		Ratio per mille.			Ratio per mille.
Arrah	...	49·1	Poori	...	65·0
Narainganj	...	41·4	Narainganj	...	58·0
Mouhlyr	...	38·0	Jessore	...	49·0
Utterpara	...	37·7	Ranaghat	...	47·0
Serampore	...	37·3	Utterpara	...	47·2
Bali	...	31·6	Serampore	...	41·2
Comillah	...	30·8	Chittagong	...	37·6
Chittagong	...	30·5	Darjiling	...	37·0
			Burdwan	...	33·6
			Comillah	...	34·7
			Hughli and Chinsurah	...	32·8
			Rampore Beaulah	...	31·5

3. The only noticeable point, in connection with the incidence of the specific death-causes in comparison with the outcome of the preceding week, is a diminution of mortality from fever and the maladies classed under the head of "Other causes"—*vide* subjoined table:—

	Ratio per mille during the weeks ending—	
	18th January 1890.	11th January 1890
Cholera	2·3	2·4
Small-pox	6	4
Fever	5·9	11·5
Bowel complaints	3·1	3·1
Injury	3	4
Other causes	6·6	8·1

4. Of the death-causes above indicated, while small-pox continued to prevail with added severity in the Poori Municipality (mortality 18·9 per 1,000 of population, against 14·7 per 1,000 during the preceding week ending 11th January), cholera, fever and "other causes" proved conspicuously fatal in the following Municipalities:—

Cholera.		Fever.		Other causes.	
	Ratio per mille.		Ratio per mille.		Ratio per mille.
Jessore	30·6	Ranaghat	29·9	Poori	25·2
Narainganj	20·7	Darjiling	29·6	Narainganj	24·7
Hughli and Chinsurah	9·8			Comillah	19·3
Chittagong	9·1			Serampore	17·7
Dacca	5·2			Burdwan	16·8
Howrah	4·6			Chittagong	11·7

5. The death-rates in relation to Sex, Class and Age stood as noted below:—

According to Sex.		According to Class		According to Age.	
	Ratio per mille.		Ratio per mille.		Ratio per mille.
Males	23·3	Christians	14·9	Under 1 year	159·8
Females	20·3	Hindus	21·5	1 and under 5 years	23·5
Ratio of male deaths to every 100 female deaths, calculated on the proportion such mortality bears to the total male and female population	115	Mahomedans	22·8	5 " 10 "	8·9
		Buddhists	51·4	10 " 15 "	8·6
				15 " 20 "	9·6
				20 " 30 "	14·8
				30 " 40 "	13·9
				40 " 50 "	20·3
				50 " 60 "	22·8
				60 years and upwards	68·0

W. H. GREGG, Dip. Publ. Health, Camb.,
Sanitary Commissioner for Bengal.

The 3rd February 1890.

Statement showing the Results of the Registration of Births and Deaths in the principal Municipalities in Bengal during the week ending 18th January 1930

[illegible]

DISTRICTS.		NAMES OF MUNICIPALITIES.		DEATHS AMONG—										RATIO PER 1,000 OF POPULATION PER ANNUM.										MORTALITY ACCORDING TO AGE.																	
				Hindus.		Mahomedans.		Buddhists.		Other classes.		Christians.		Hindus.		Mahomedans.		Buddhists.		Other classes.		Under 1 year.		1 and under 5 years.		5 and under 10 years.		10 and under 15 years.		15 and under 20 years.		20 and under 30 years.		30 and under 40 years.		40 and under 50 years.		50 and under 60 years.		60 years and upwards.	
Burdwan	Burdwan	12	5	417	253	...	6	1	...	1	427	480	...	507	373
Midnapore	Midnapore	7	3	140	210	...	1	500
Hughli	Hughli and Chinsurah	15	5	309	452	...	1	648	703	751
Sourpore	Sourpore	19	2	392	1109	...	5	2	2107	804	...	404
	Uttarpore	8	458	1	2230	
Howrah	Howrah	15	11	17	267	279	5	6	2018
Bally	Bally	6	233	2	1	2873
	Kishnashor	1	28	1819	
Banshat	Banshat	14	4	284	1224	1308
	Saptapore	8	1	161	54	...	5	2000	
Jessore	Jessore	0	692	272	...	1	2562
Rajshahye	Pempore Beaulash	2	10	105	530	...	2	3005
Darjiling	Darjiling	8	2	1018
Dacca	Dacca	10	17	200	225	...	2	6301
	Narainganj	5	5	710	422	...	3	3771
Chittagong	Chittagong	1	5	653	272	433	3	1	3771
Tipperah	Gomilsh	4	5	350	352	...	1	170	
Patna	Patna City	19	7	79	89	...	4	453	
Gya	Gya	26	10	208	323	...	5	1400
Shahabad	Arrah	13	4	218	108	...	2	807	
Monroepore	Monroepore	6	6	87	250	...	2	1059
Darbhanga	Darbhanga	10	10	204	206	...	2	608
Chupra	Chupra	10	131	0	1863
Shahajpore	Shahajpore	15	7	196	211	...	0	2013
Monohr	Monohr	16	5	186	207	...	0	2101
Purneah	Purneah
Poori	Poori	3	657	2	6	3432
Total		37	149	189	213	...	28	62	10	16	16	60	47	49	36	80	1598

W. H. GREGG, Dep. Publ. Health, Camb.,
Sanitary Commissioner for Bengal.

OFFICE OF SANITARY COMMISSIONER FOR BENGAL,
The 5th February 1890

PUBLIC WORKS DEPARTMENT, BENGAL.

IRRIGATION BRANCH.

Statement showing heights over mean sea-level and low-water in the Rivers Ganges, Bhagirathi, Jett-miles, and Brahmaputra for the month of November 1889.

Date.	RIVER GANGES										RIVER BHAGIRATHI.		RIVER JETT-MILES.		RIVER BRAHMAPUTRA.	
	Mirzapur.		Benares.		Dinapore.		Monghyr.		Sahabganj.		Rangpoor.		Bardhaman.		Gowhaty.	
	From Allahabad.	Height over mean sea-level.	From Allahabad.	Height over mean sea-level.	From Dinapore.	Height over mean sea-level.	From Benares.	Height over mean sea-level.	From Benares.	Height over mean sea-level.	From Benares.	Height over mean sea-level.	From Benares.	Height over mean sea-level.	From Benares.	Height over mean sea-level.
1st	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
2nd	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
3rd	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
4th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
5th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
6th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
7th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
8th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
9th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
10th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
11th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
12th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
13th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
14th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
15th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
16th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
17th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
18th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
19th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
20th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
21st	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
22nd	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
23rd	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
24th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
25th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
26th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
27th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
28th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
29th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95
30th	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95	915.47	7.95

CALCUTTA;
The 4th February 1890.G. A. G. SHAW,
Under-Secretary to the Govt. of Bengal.

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.
SOUTH-WESTERN CIRCLE.

CALCUTTA AND EASTERN CANALS.

Statement showing quantities of Goods carried during the month of November 1889.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.	Rupers.	Tons.	Rupers.	
125	1. Grain	2,200	3	2,203	2,44,575	2,203	2,44,575	* For details, see next page.
.....	2. Cotton	.....	.....	.....	.....	.....	.....
20	3. Oilseeds	272	.....	272	26,900	272	26,900
431	4. Salt	507	6,975	7,482	7,85,636	7,482	7,85,636	
.....	5. Piece-goods	.....	.....	.....	.....	.....	.....
8	6. Metal	42	39	81	29,250	81	29,250	
95	7. Building materials	2,221	104	2,325	26,719	2,325	26,719	
3,225	8. Miscellaneous*	28,864	2,134	30,998	38,76,935	30,998	38,76,935	
550	9. Fuel	9,168	3,498	12,666	1,03,268	12,666	1,03,268	
.....	10. Timber	.....	.....	.....	.....	.....	.....
.....	11. Bamboos	.....	.....	.....	.....	.....	.....
4,454	12. Total	43,274	12,753	56,027	50,93,283	56,027	50,93,283	
5,914 & 1 raft.	13. Total of same month last year.	{ 56,608 & 75 c. ft.	15,625	72,233 & 75 c. ft.	{ 58,29,503	{ 72,233 & 75 c. ft.	{ 58,29,508	

14. Total number of boats plying cargo	No.	3,775	679	4,454	Total tollage of month— 24 + 25 + 26	Rs. A. P. 34,591 11 6
14a. Ditto empty boats	..	1,648	779	2,427		
15. Total number of boats plying passenger	No.	413	13	426	Total tollage of same month last year	43,658 14 0
16. Total registered tonnage, cargo	Tons	119,547	32,502	152,049		
17. Total registered tonnage, passenger	Tons	898	42	940	Memorandum of Tollage.	
18. Ton-mileage	...	1,059,905	325,020	1,384,925	Rs. A. P.	
19. Estimated value of cargo	Rs.	39,67,044	11,26,239	50,93,283	1. Balance not recovered on the 1st of the month	839 12 9
20. Number of passengers	No.	1,612	104	1,716	2. Tollage per month	34,591 11 6
21. Rafts, bamboos	C. ft.	.....	.....	.....	3. Total	35,431 8 3
22. Do., bullahs	..	.....	.....	.....	4. Amount paid into Treasury during the month	34,135 12 6
23. Estimated value of rafts	Rs.	.....	.....	.....	5. Balance due at the end of the month	1,295 11 9
24. Tollage on boats	..	26,618-0-6	7,973-11-0	34,591-11-6		
25. Compounded tollage on boats	Rs.	.....	.....	.....
26. Tollage on rafts	..	.....	.....	.....
27. Total tollage on boats per ton-mile	Rs.	.....	.....	0-0-4-79		
28. Ditto on rafts per 100 cubic feet	Rs.	.....	.....	.....

ARTICLES OF TRAFFIC INCLUDED IN ITEM 8 (MISCELLANEOUS).
CALCUTTA AND EASTERN CANALS.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	
		Up.	Down.	Total.	Rupees.	Tons.	
1,284	(a) Jute ...	23,814	.....	23,814	30,00,510	23,814	30,00,510
65	(b) Jaggery ...	542	7	549	61,500	549	61,500
3	(c) Sugar ...	24	.....	24	6,075	24	6,075
5	(d) Tobacco ...	8	19	27	5,250	27	5,250
889	(e) Fish ...	133	3	136	38,106	136	38,106
32	(f) Hides ..	19	.....	19	4,170	19	4,170
54	(g) Poultry ..	7	.....	7	5,247	7	5,247
93	(h) Hay and straw ...	483	.....	483	12,012	483	12,012
116	(j) Oil ...	.....	1,793	1,793	2,51,000	1,793	2,51,000
80	(k) Earthenware ...	2	.....	2	595	2	595
654	(m) Other miscella- neous ...	3,832	312	4,144	4,92,470	4,144	4,92,470
3,225	Total Miscellaneous...	28,864	2,134	30,998	38,76,935	30,998	38,76,935

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.
SOUTH-WESTERN CIRCLE.

TOLLY'S NULLAH.

Statement showing quantities of Goods carried during the month of November 1889.

Number of Rafts or Boats.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.		Value.	Quantity.	Value.	
		Up.	Down.	Total. Rupees.	Tons. Rupees.	Rupees.	
871	1. Grain ...	2,809	.....	2,809	2,20,600	2,809	2,20,600
10	2. Cotton ...	66	.....	66	33,300	66	33,300
2	3. Oilseeds ...	34	.....	34	3,325	34	3,325
61	4. Salt ...	535	295	830	87,187	830	87,187
	5. Piece-goods ...	.....	.....	.....	.....	.....	.....
	6. Metal ...	.....	.....	.....	.....	.....	.....
387	7. Building materials ...	3,797	7	3,804	15,912	3,804	15,912
1,068	8. Miscellaneous* ...	3,546	7	3,616	4,62,827	3,616	4,62,827
250	9. Fuel ...	2,735	43	2,778	22,772	2,778	22,772
Rafts	10. Timber ...	2,175 c. ft.	190 c. ft.	2,365 c. ft.	5,912	2,365 c. ft.	5,912
"	11. Bamboos ...	225 "	.....	225 "	37	225 "	37
49 & Rafts.	12. Total ...	{ 13,522 & 2,400 c. ft.	{ 415 & 190 c. ft.	{ 13,937 & 2,590 c. ft.	{ 8,51,872 } { 13,937 & 2,590 c. ft. }	{ 8,51,872 }	• For details, see next page.
19 & Rafts.	13. Total of same month last year ...	{ 19,745 & 6,880 c. ft.	{ 752 & 2,735 c. ft.	{ 20,497 & 9,615 c. ft.	{ 14,05,133 } { 20,497 & 9,615 c. ft. }	{ 14,05,133 }	
		Up.	Down.	Total.			Rs. A. P.
Total number of boats plying cargo ... No.		2,565	84	2,649	Total tollage of month— 24 + 25 + 26 ...		7,146 5 6
Ditto empty boats ...		1,174	226	1,400	Total tollage of same month last year ...		11,898 4 0
Total number of boats plying passenger ... No.		684	21	705	<i>Memorandum of Tollage.</i>		
Total registered tonnage, cargo ... Tons		38,012	2,685	40,697			Rs. A. P.
Total registered tonnage, passenger ... Tons		1,926	81	2,007			
Ton-mileage ...		353,608	42,960	396,568	1. Balance not recovered on the 1st of the month ...		270 11 3
Estimated value of cargo Rs.		8,04,145	41,778	8,45,923	2. Tollage per month ...		7,146 5 6
Number of passengers No.		8,371	210	8,581	3. Total ...		7,417 0 9
Rafts, bamboos C. ft.		225	.....	225			
Bullahs ...		2,175	190	2,365			
Estimated value of rafts Rs.		5,474	475	5,949			
Tollage on boats ...		6,436-9-6	678-1-6	7,114-11-0			
Compounded tollage on boats ... Rs.		.....	.....	.....
Tollage on rafts ...		18-2-6	13-8-0	31-10-6	4. Amount paid into Treasury during the month ...		7,183 5 9
Total tollage on boats per ton-mile ... Rs.		.....	.....	0-0-3-44			
Ditto on rafts per 100 cubic feet ... Rs.		.....	.....	1-3-6	5. Balance due at the end of the month ...		233 11 0

ARTICLES OF TRAFFIC INCLUDED IN ITEM 8 (MISCELLANEOUS).
TOLLY'S NULLAH.

Number of boats or rafts.	Description.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.	
		Quantity—Tons.			Value.	Quantity.	Value
		Up.	Down.	Total.	Rupers.	Tons.	Rupers.
105	(a) Jute ...	465	.....	465	58,590	465	58,590
54	(b) Jaggery ...	389	.....	389	43,600	389	43,600
.....	(c) Sugar ...	.....	.....	...	.....	.....	.....
16	(d) Tobacco ...	86	29	115	22,575	115	22,575
135	(e) Fish ...	9	7	16	4,614	16	4,614
.....	(f) Hides ...	.....	.....	.....	...	.....	.....
10	(g) Poultry ...	5	.....	5	1,122	5	1,122
399	(h) Hay and straw...	603	.....	603	14,787	603	14,787
53	(j) Oil ...	593	.....	593	83,000	593	83,000
70	(k) Earthenware ...	94	12	106	1,484	106	1,484
226	(m) Other miscellane- ous.	1,302	22	1,324	2,33,055	1,324	2,33,055
1,068	Total Miscellaneous...	3,546	70	3,616	4,62,827	3,616	4,62,827

ABSTRACT FOR THE MONTH OF NOVEMBER 1889, AS COMPARED WITH THE
CORRESPONDING MONTH OF THE PREVIOUS YEAR.

	TRAFFIC, 1889-90.			TRAFFIC, 1888-89.		
	During the month.		To end of the month.	During the month.		To end of the month.
	Rs.	A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Calcutta and Eastern Canals ...	34,591	11 6	1,91,202 4 3	43,658 14 0	2,35,377 13 6	
Tolly's Nullah ...	7,146	5 6	56,073 4 6	11,898 4 0	81,362 10 0	
Total ...	41,738	1 0	2,47,275 8 9	55,557 2 0	3,16,740 7 6	

CALCUTTA,
The 4th February 1890.G. A. G. SHAW,
Under-Secretary to the Govt. of Bengal.

CIRCULAR AND EASTERN CANALS.

*Approximate Return of Traffic for the week ending Saturday, the 1st February 1890,
as compared with the corresponding week of the previous year.*

NATURE OF CARGO.		WEEK ENDING SATURDAY, THE 1ST FEBRUARY 1890.			WEEK ENDING SATURDAY, THE 2ND FEBRUARY 1889.		
		Number of boats.	Weight of cargo.	Tollage.	Number of boats.	Weight of cargo.	Tollage.
		No.	Mds.	Rs.	No.	Mds.	Rs.
Rice and paddy	...	1,780	3,82,110	6,271	1,797	3,64,825	6,342
Jute	...	177	1,15,075	2,110	109	85,125	1,596
Firewood	...	87	58,400	806	144	83,725	1,222
Other articles	...	556	1,73,495	2,605	1,205	3,27,255	3,710
Total	...	2,900	7,24,080	11,792	3,257	8,60,930	12,810

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY.

Approximate Return of Traffic for week ended 26th January 1890, on 1,625½ miles open

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week on per mile of railway ..	*316,167	*3,41,089 6 0	25,10,601 10	5,56,400 1 0	20,612 10 0	9,21,104 3 0	69,7104	50,0314	169,751
For previous 5 weeks of half- year ..	636,076	7,53,240 3 0	46,47,000 20	12,33,599 15 0	50,474 0 0	24,17,311 2 0	160,4154	286,657	466,1724
Total for 6 weeks ..	952,143	10,94,322 9 0	71,60,601 30	17,90,099 2 0	71,086 10 0	32,42,507 5 0	230,034	326,6884	556,7224
COMPARISON.									
Total for corresponding week of previous year ..	238,1134	2,59,210 2 11	20,21,906 30	6,31,824 6 0	14,677 12 4	9,34,733 6 0	65,169	46,010	163,700
Per mile of railway correspond- ing week of previous year ..	.....	164 14 11	.....	416 3 0	9 0 11	612 11 10	.....	.....	.....
Total to correspond as date of previous year ..	870,808	10,42,000 18 0	1,05,55,089 20	23,24,317 4 0	56,080 0 10	31,22,594 2 7	242,702	372,146	614,848

* The increase in coaching traffic is due to the "Mugh Mela" held at Allahabad.

*Approximate Statement of gross receipts of the East Indian Railway, prepared in accordance with Public Works
Department Circular No. XXI, Railway, dated 23rd July 1885.*

RECEIPTS FOR WEEK ENDING 20TH JANUARY 1889.			RECEIPTS FOR WEEK ENDING 20TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1888 TO 20TH JANUARY 1889.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 20TH JANUARY 1890.			Total increase in 1890.	Total decrease in 1889.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
1,0854	9,34,733	615	1,5254	9,25,194	606	1,8254	3,50,02,319	548	1,6254	3,58,03,574	540	.....	1,56,745

PATNA-GYA STATE RAILWAY.

Approximate Return of Traffic for week ended 25th January 1890, on 57½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		(Other earnings estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	18,933	6,936 3 0	24,870 20	2,551 10 0	55 3 0	9,545 15 0	1,700	604	2,304
Or per mile of railway	27	121 4 2	399 0	44 10 7	0 15 5	161 14 3	.....	.....	.....
For previous 3 weeks of half-year	33,740	17,636 3 0	34,305 30	5,860 2 0	124 13 0	23,529 2 0	4,444	2,255	6,722
Total for 4 weeks	47,282	24,471 6 0	1,21,210 10	8,415 12 0	179 15 0	31,073 1 0	6,234	2,853	9,116
COMPARISON.									
Total for corresponding week of previous year	11,244	5,917 10 7	62,035 20	2,067 18 0	29 9 0	8,014 15 7	1,947	1,135	3,082
Per mile of railway corresponding week of previous year	197	103 7 3	1,064 30	36 2 5	0 5 2	140 1 11	.....	.....	.....
Total to corresponding date of previous year	44,044	24,231 12 5	1,32,237 20	6,987 4 0	131 11 0	31,350 15 3	7,100	2,471	9,571

Approximate Statement of gross receipts of the Patna-Gya State Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 25TH JANUARY 1890.			RECEIPTS FOR WEEK ENDING 25TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1890.			Total increase in 1890.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
57½	Rs. 6,913	Rs. 140	57½	Rs. 9,546	Rs. 167	57½	Rs. 4,00,000	Rs. 163	57½	Rs. 4,15,805	Rs. 169	Rs. 15,497	.....

TARKESSUR BRANCH RAILWAY.

Approximate Return of Traffic for week ended 25th January 1890, on 29½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		(Other earnings estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	29,713	5,296 1 0	12,410 30	475 4 8	7 3 0	5,708 5 0	900	84	984
Or per mile of railway	.....	236 10 10	.....	19 9 0	0 3 2	236 9 9	.....	.....	.....
For previous 3 weeks of half-year	45,410	12,163 7 0	27,062 10	1,097 4 0	18 15 0	13,279 7 0	2,321	168	2,489
Total for 4 weeks	60,123	17,459 8 0	40,104 0	1,572 8 0	25 15 0	18,987 15 0	3,221	249	3,470
COMPARISON.									
Total for corresponding week of previous year	20,073	5,152 2 10	7,783 30	296 9 0	9 5 0	5,458 5 10	896	73	969
Per mile of railway corresponding week of previous year	.....	231 8 11	.....	13 5 3	0 5 10	243 5 0	.....	.....	.....
Total to corresponding date of previous year	71,097	17,745 7 10	34,096 10	1,190 1 0	27 11 9	18,959 4 7	3,329	267	3,596

Approximate Statement of gross receipts of the Tarkessur Branch Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 25TH JANUARY 1890.			RECEIPTS FOR WEEK ENDING 25TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1890.			Total increase in 1890.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
29½	Rs. 4,450	Rs. 245	29½	Rs. 5,700	Rs. 267	29½	Rs. 2,35,081	Rs. 236	29½	Rs. 2,32,964	Rs. 233	.....	Rs. 2,067

EASTERN BENGAL STATE RAILWAY.

(INCLUDING N. B., DACCA, K. AND D., AND ASSAM-BEHAR SECTIONS.)

Approximate Return of Traffic for week ended 18th January 1890, on 747 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated), including steam-b. st.	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	146,090	78,890 0 0	6,46,490 0	1,00,500 0 0	16,090 0 0	2,22,410 0 0	22,954	36,949	59,907
per mile of railway	196	103 0 0	822 0	115 0 0	2 0 0	220 0 0	.....	.....	.....
per previous 2 weeks of half-year	270,740	1,18,290 0 0	9,71,200 0	2,30,010 0 0	26,910 0 0	3,41,960 0 0	50,569	84,709	135,136
Total for 3 weeks	416,830	1,97,110 0 0	16,17,080 0	3,37,440 0 0	41,890 0 0	6,34,390 0 0	57,927	96,716	154,643
COMPARISON.									
Total for corresponding week of previous year	137,037	67,827 0 0	5,35,578 0	1,20,468 0 0	13,981 0 0	2,01,976 0 0	21,533	27,430	48,963
per mile of railway corresponding period of previous year	206	100 0 0	790 0	179 0 0	2 0 0	281 0 0	.....	.....	.....
Total to corresponding date of previous year	396,830	1,77,804 0 0	13,57,978 0	3,18,861 0 0	40,634 0 0	5,36,201 0 0	53,679	81,560	135,239

* Excluding steamer earnings.

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Eastern Bengal State Railway.

RECEIPTS FOR WEEK ENDING 19TH JANUARY 1889.			RECEIPTS FOR WEEK ENDING 19TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 19TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 19TH JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Rs.	Rs.
Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.
2,01,976	800	747	2,02,410	836	673	87,78,000	311	724	92,72,553	305	4,03,043	...	...

* Audited up to week ending 23rd November 1889.

BENGAL CENTRAL RAILWAY.

Approximate Return of Traffic for week ended 18th January 1890, on 125 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.				
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.		
	Rs.	A. P.	Mds.	c.	Rs.	A. P.	Rs.	A. P.			
Total traffic for the week	24,200	9,740 0 0	46,210 0	2,010 0 0	80 0 0	12,430 0 0	3,740	1,038	5,678		
per mile of railway	194	78 0 0	322 0	21 0 0	.....	99 0 0	.....	.....	.....
per previous 2 weeks of half year	48,180	19,440 0 0	92,350 0	4,330 0 0	130 0 0	21,800 0 0	5,870	3,044	8,914		
Total for 3 weeks	72,660	29,180 0 0	1,37,560 0	6,340 0 0	210 0 0	33,720 0 0	9,606	4,082	13,688		
COMPARISON.											
Total for corresponding week of previous year	28,733	9,777 0 0	46,875 0	2,320 0 0	56 0 0	12,102 0 0	3,736	1,940	5,676		
per mile of railway corresponding period of previous year	306	79 0 0	375 0	19 0 0	.....	97 0 0	.....	.....	.....
Total to corresponding date of previous year	78,002	28,210 0 0	1,26,445 0	6,080 0 0	2,506 0 0	33,715 0 0	11,161	5,280	16,441		

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Bengal Central Railway.

RECEIPTS FOR WEEK ENDING 19TH JANUARY 1889.			RECEIPTS FOR WEEK ENDING 19TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 19TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 19TH JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Rs.	Rs.
Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.
12,102	97	125	12,430	99	125	5,70,000	110	125	6,00,207	115	20,307	...	...

* Audited up to week ending 23rd November 1889.

DACCA STATE RAILWAY.

Approximate Return of Traffic for week ended 18th January 1890, on 86 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coachings receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	16,250	5,610 0 0	39,210 0	4,390 0 0	190 0 0	10,050 0 0	2,404	1,880	3,684
Or per mile of railway	189	66 0 0	456 0	50 0 0	1 0 0	117 0 0	.....	.....	.....
For previous 2 weeks of half year	29,270	11,290 0 0	57,640 0	5,740 0 0	300 0 0	17,650 0 0	4,036	1,055	5,191
Total for 3 weeks	45,520	16,920 0 0	96,850 0	10,040 0 0	490 0 0	27,680 0 0	6,440	2,935	9,375
COMPARISON.									
Total for corresponding period of previous year	14,437	4,322 0 0	21,273 0	2,256 0 0	63 0 0	6,641 0 0	2,479	625	3,104
Per mile of railway corresponding period of previous year	165	50 0 0	247 0	26 0 0	1 0 0	77 0 0	.....	.....	.....
Total to corresponding date of previous year	41,770	12,478 0 0	53,191 0	3,571 0 0	230 0 0	16,368 0 0	6,753	1,696	8,449

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Dacca State Railway.

RECEIPTS FOR WEEK ENDING 19TH JANUARY 1889.			RECEIPTS FOR WEEK ENDING 18TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 19TH JANUARY 1889.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 18TH JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
86	6,641	77	86	10,050	117	86	2,50,862	60	86	*3,10,814	87	70,952	.....

* Audited up to week ending 23rd November 1889.

NALHATI STATE RAILWAY.

Approximate Return of Traffic for the week ending 25th January 1890 on 27½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coachings receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	8,042	1,060 0 0	7,377 0	525 0 0	7 0 0	1,592 0 0	509	254	763
Or per mile of railway	112	39 0 0	271 0	19 0 0	.....	59 0 0	.....	.....	.....
For previous 2 weeks of half year	7,710	2,693 0 0	47,505 0	2,789 0 0	44 0 0	5,535 0 0	1,509	653	1,962
Total for 3 weeks	15,752	3,753 0 0	54,882 0	3,314 0 0	51 0 0	7,117 0 0	1,618	907	2,525
COMPARISON.									
Total for corresponding week of previous year	5,178	1,117 0 0	17,241 0	832 0 0	32 0 0	1,981 0 0	509	636	1,145
Per mile of railway corresponding week of previous year	117	41 0 0	634 0	31 0 0	1 0 0	78 0 0	.....	.....	.....
Total to corresponding date of previous year	11,751	4,563 0 0	54,628 0	1,937 0 0	71 0 0	7,311 0 0	1,690	2,063	3,753

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Nalhati State Railway.

RECEIPTS FOR WEEK ENDING 26TH JANUARY 1889.			RECEIPTS FOR WEEK ENDING 25TH JANUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 26TH JANUARY 1889.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
27½	1,981	73	27½	1,592	59	27½	62,562	76	27½	61,905	73	.....	67

TIRHOOT STATE RAILWAY.

Approximate Return of Traffic for the week ending 25th January 1890, on 273 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weights carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Traffic for the week	47,791	19,065 0 0	2,73,799 0	31,503 0 0	8,441 0 0	55,907 0 0	6,236	8,092	14,328
per mile of railway	175	70 0 0	1,003 0	116 0 0	3 0 0	197 0 0	.....	.....	.....
previous 3 weeks of half	114,179	52,899 0 0	5,00,480 0	62,919 0 0	12,659 0 0	1,28,277 0 0	15,165	20,741	35,907
Total for 3 weeks	162,270	71,962 0 0	8,40,209 0	94,122 0 0	15,000 0 0	1,84,084 0 0	21,400	29,633	51,033
COMPARISONS.									
for corresponding week previous year	37,973	13,680 0 0	1,42,691 0	13,247 0 0	2,706 0 0	29,623 0 0	8,977	5,897	14,874
mile of railway corresponding week of previous year	139	50 0 0	523 0	46 0 0	1 0 0	99 0 0	.....	.....	.....
to corresponding date of previous year	141,637	50,845 0 0	5,09,451 0	66,177 0 0	11,496 0 0	1,08,808 0 0	19,929	20,000	40,029

* Steam-boat earnings excluded in calculating "Total earnings per mile of Railway."

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Tirhoot State Railway.

RECEIPTS FOR WEEK ENDING 25TH JANUARY 1889			RECEIPTS FOR WEEK ENDING 25TH JANUARY 1890			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1889			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 25TH JANUARY 1890			Total increase in 1889-90	Total decrease in 1889-90
Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.		
Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.
29,623	100	273	55,907	204	204.40	13,58,011	123	273	16,67,280	140	3,09,276	.....	.....

DARJEELING-HIMALAYAN RAILWAY COMPANY, LIMITED.

Approximate earnings for first 11 days of January 1890

Corresponding period of last year

Increase

Rs.

9,482

8,017

1,465

Miles open first 11 days of January 1890

Corresponding period of last year

Miles.

51

51

Receipts per mile open first 11 days of January 1890

Corresponding period of last year

Increase

Rs. A. P.

185 14 9

167 3 1

28 11 8



SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, FEBRUARY 12, 1890.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on payment of Six Rupees per annum if delivered in Calcutta, or Twelve Rupees if sent by Post.

CONTENTS.

	Page.		Page.
ANNUAL Award of a Medal to the Mozufferpore Zillah School	311	STATEMENT of Rainfall in Bengal for the week ending Friday (s.a.m.) the 7th of February 1890	323
Incidence of Tolls in the Circular and Eastern Canals	312	Results of the Meteorological Observations taken at the Alipore Observatory from 2nd to 8th February 1890	327
Resolution on the Report of the Committee appointed to enquire into the Administration of the Bone Canals	313	Abstract of the results of the Barometric and Thermometric Observations taken at 10 A.M. at the Meteorological Office, Chowringhee, in the month of January 1890	330
Quarterly Inspection of the Kidderpore Dock Works	324	Results of the Barometrical and Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 2nd to 8th February 1890	333
Rainfall, Weather, and State and Prospects of the Crops	325	Statement showing the Results of the Registration of Births and Deaths in the Principal Municipalities in Bengal during the week ending 25th January 1890	335
Prices-current (retail) of Food-grains, Firewood and Salt in the Head-quarter Station Bazaar of the districts of Bengal on the 31st January 1890	326	Areas leased for irrigation up to the end of November 1890	337
Statement showing the stocks of rice in and around Calcutta	327	Circular and Eastern Canals for the week ending 8th February 1890	338
Abstract of the results of Meteorological Observations taken at the Alipore Observatory in the month of January 1890	328	Weekly Return of Traffic Receipts on Indian Railways	339
Meteorological Report of the Province of Bengal for the month of January 1890	329		
Table of Rainfall recorded at Stations in Bengal in January 1890	331		
Meteorological Report of the Province of Bengal for the week ending Friday the 7th of February 1890	332		

ANNUAL AWARD OF A MEDAL TO THE MOZUFFERPORE ZILLAH SCHOOL.

GENERAL DEPARTMENT—EDUCATION.

Calcutta, the 5th February, 1890.

RESOLUTION.

READ—

A letter from the Commissioner of Patna, No. 180G, dated the 22nd March, 1889.

Read also—

A letter from the Director of Public Instruction, No. 2023, dated the 5th April, 1889.

In commemoration of the visit of the Lieutenant-Governor to Sursund in the district of Mozufferpore, Mussamut Dulhin Golab Kuer and her son-in-law, Babu Damodar Deb Narain Singh, have paid into the Mozufferpore Treasury the sum of Rs. 900 for investment in Government securities as an endowment for the annual award of a medal, to be designated the "Bayley Medal," to the student of the Mozufferpore Zillah School obtaining the highest marks in Sanskrit at the University Entrance Examination of each year. The Lieutenant-Governor is pleased to accept the donation, and tenders his thanks to the donors for their liberality. The Magistrate of Mozufferpore will be the administrator of the fund.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Commissioner of Patna for information and for communication to the donors, and to the Director of Public Instruction for information.

Ordered also, that a copy of this Resolution be published in the *Calcutta Gazette*.

By order of the Lieutenant-Governor of Bengal,

P. NOLAN,

Secretary to the Government of Bengal.

INCIDENCE OF TOLLS IN THE CIRCULAR AND EASTERN CANALS.

PUBLIC WORKS DEPARTMENT, BENGAL.—IRRIGATION.

RESOLUTION.

No. 238 I.A.

Dated Calcutta, the 11th February 1890.

READ—

- (1) Memorial from the Bengal National Chamber of Commerce, dated 17th November 1887.
- (2) Letter No. 2455T., from Agent, Bengal Central Railway, dated 24th November 1887.
- (3) Bengal Government Notifications Nos. 349-350, dated 17th September 1889.
- (4) Letter from Manager, Eastern Bengal Railway, No. 821, dated 19th October 1889.
- (5) Bengal Government Notification No. 382, dated 21st October 1889.
- (6) Letter from Secretary, Young Men's Association, Senhati, dated 6th November 1889.
- (7) Letter from Messrs. Hoare, Miller and Company, No. 904, dated 10th December 1889.
- (8) Bengal Government Notification No. 455, dated 17th December 1889.

In regard to the complaints which have been made against the tolls charged on boats using the channels included in the "Circular Canal Route," the Lieutenant-Governor has arrived at the conclusion that it is advisable to enquire into the system of measurements and incidence of tolls charged under the rules and notifications now in force.

2. *It is resolved* therefore to appoint, for the above purpose, a Commission consisting of—

Major McArthur, R.E.	...	...	...	<i>President.</i>
Mr. W. C. Boyce, District Traffic Superintendent, Eastern Bengal Railway	...	...	...	} <i>Members.</i>
Bahoo Sitansath Roy, Honorary Secretary, Bengal National Chamber of Commerce	...	...	...

3. The enquiry will embrace the following points—

1. Present system of boat measurement, and whether it can be improved in the direction of (a) greater accuracy of gross tonnage or (b) ascertaining net tonnage.
2. The incidence of existing rates on the goods carried in the Canals; whether the rates should be revised; and whether differential rates should be introduced or not.
3. The boundaries within which the tolls are levied.
4. The practicability of levying tolls on the basis of "challans" of the merchants or others whose goods are carried.

ORDER.—Ordered that copies of this Resolution be sent to the President and members named to serve on the Commission for information and guidance, and to the Revenue, Appointment and Financial Departments of this Government, the Board of Revenue, the Commissioner of the Presidency Division, and the Examiner of Public Works Accounts, Bengal, for information.

By order of the Lieutenant-Governor of Bengal,

J. M. McNEILE, Col., R.E.,

Secretary to the Government of Bengal,

P. W. Dept.

RESOLUTION ON THE REPORT OF THE COMMITTEE APPOINTED
TO ENQUIRE INTO THE ADMINISTRATION OF THE
SONE CANALS.

No. 2061.

Government of Bengal.

PUBLIC WORKS DEPARTMENT.

Dated Calcutta, the 4th February 1890.

RESOLUTION.

READ—

1. Resolution No. 1884I., dated Calcutta, the 11th of November 1887, by the Government of Bengal, Public Works Department, appointing a Committee to enquire into the Administration of the Sone Canals.
2. Report, dated the 13th March 1888, of the Committee appointed to enquire into the Administration of the Sone Canals.
3. Note, dated the 14th of January 1890, by Colonel C. W. L. Harrison, R.E., Chief Engineer, Bengal, on the above-mentioned report.
4. Minute, dated the 15th June 1888, by the Hon'ble F. M. Halliday.
5. Letter, dated the 25th June 1888, from the Board of Revenue, Lower Provinces.
6. Letter, dated the 30th June 1888, from Mr. L. H. Mylne, of Behen, Shahabad.
7. Note, dated the 10th July 1888, by the Hon'ble Mr. Nolan, on the report of the Committee appointed to enquire into the Administration of the Sone Canals.
8. Letter No. 849I., of date the 31st August 1888, from Mr. A. B. Power, Collector of Shahabad.
9. Note, dated the 14th of December 1888, by Mr. C. W. Odling, Superintending Engineer, Sone Circle, on irrigation operations from the Sone Canals during the *kharif* season of 1888-89.
10. Note, dated the 4th of February 1889, by Mr. H. Luson, C.S., upon crop experiments in canal-irrigated *dhan* taken in the Sone Circle during the *kharif* season of 1888-89.
11. Report, dated the 20th of March 1889, by Mr. H. Luson, C.S., upon certain points connected with the administration of the Sone Canals.
12. Pamphlet by Baboo Kanduji Sahai, B.A., B.L., on certain aspects of the Sone irrigation question, Dinapore, 1889, received with a letter, dated 26th June 1889.
13. Revenue report, dated the 13th September 1889, by the Superintending Engineer, on the Sone Canals for the year 1888-89.
14. Note, dated the 12th of January 1890, by Mr. C. W. Odling, Superintending Engineer, Sone Circle, on irrigation operations from the Sone Canals during the *kharif* season 1889-90.
15. Note, dated the 14th January 1890, by Mr. C. W. Odling, Superintending Engineer, on Drainage Works carried out and still required in connection with the Sone Canals.

The Lieutenant-Governor, when on tour in Behar in November 1887, received a memorial, signed by certain leading residents of the Shahabad and Patna districts, complaining of the system under which lands irrigated by the Sone Canals were assessed and the water-rates collected. Sir Stuart Hayley travelled by road through the part of the area irrigated in which complaints were most numerous and by steamer down the Buxar Canal. On a full consideration of the allegations made in the memorial and those contained in separate letters received from influential landholders, His Honour came to the conclusion that it was desirable to appoint a Committee to examine into the working of the entire system, with a view to provide remedies, where possible, for admitted defects, and to improve the rules and, if necessary, the law under which the system was administered.

2. The Committee, which was composed of Mr. H. J. S. Cotton, C.S., as President, with Mr. C. W. Odling, M.E., M.I.C.E., and Rai Jai Prokash Lall, Bahadur, as Members, met at Arrah on the 1st of December 1887, and, after local investigations extending over those parts of the Shahabad, Patna and Gya districts traversed by the canals, submitted a report, dated the 13th March 1888, signed by all the Members of the Committee, but accompanied by

dissents by Mr. C. W. Ouling and Rai Jai Prokash Lall, Bahadur, on material points. The report may be taken to be in the main that of Mr. Cotton, the President, who is, however, in regard to most of the recommendations supported by the Departmental member of the Committee.

3. The report of the Committee is clear and well arranged and accompanied by a series of appendices containing a record of the evidence, written or oral, on which the conclusions drawn and recommendations made are based. Very considerable delay has occurred in dealing with the report. The recommendations made were submitted to the criticism of various local officers, but important action was taken at once to carry out some of the Committee's proposals concerning which there was no room for doubt. A series of practical experiments touching on the question of yield of crops and indirectly on that of profit obtainable from irrigation were carried out under the superintendence of Mr. Luson. The Chief Engineer has paid two extended visits to Saahabad to watch the working of the system at different seasons, and he has now recorded the note quoted at the head of the Resolution. In that note he has explained

• Paragraphs 17, 24, 55, 64, 69, 72 and 116. the origin of the system pursued, and has noticed the changes which have been introduced since the

Committee was appointed—changes which suffice to justify the appointment of the Committee, and which show how beneficial their principal recommendations have been. The note brings together on various points the facts and considerations justifying the action of the Department where it has been impugned, and after explaining the important effect which the use of canal water has had in substituting paddy cultivation for that of *rabi* crops over a large area, and the bearing of this fact on the main questions at issue, it discusses the proposed alterations and explains how far, in the opinion of the Chief Engineer, the recommendations of the Committee are in themselves feasible and desirable as the law now stands.

4. The area irrigable by the Sone Canals, in the *kharif* season at least, is practically measured by the water supply procurable. Some 1,300,000 acres are commanded, of which it would be possible, with the supply of water ordinarily available in the river Sone, to irrigate 300,000 acres in the *kharif* and probably the same area in the *rabi* season. When the canals were in course of construction it was found that the lands commanded were about equally divided between *kharif* and *rabi* crops, and it was not anticipated that any change in the nature of the crop would follow the advent of irrigation with canal water. It was, in fact, assumed that of the area irrigated half would be cultivated with *kharif* and half with *rabi* crops. Indeed, the fear expressed by Sir G. Campbell in 1871 was that there would not be a sufficient supply of water available for the irrigation of the winter crops, and he urged that the canal should be designed with reference to the minimum supply procurable from the river Sone in that season in the driest of years. It was expected that a higher water-rate would be obtainable from *rabi* than from *kharif* cultivation.

5. The canals and distributaries were ordinarily run on the ridges, the lands bordering which, being high, were usually cultivated with winter or *rabi* crops. So soon as irrigation from the canals was commenced, there was a rapid change in the character of the cultivation. Wherever canal water is regularly available *rabi* crops have disappeared, and rice has taken their place. In the opinion of a landholder peculiarly well qualified to judge on the point, nothing but the absolute refusal of canal water for paddy would compel the ryots now to forego the cultivation of that crop. This change, which in the earlier years of canal irrigation was in process of development, added much to the difficulties necessarily experienced by canal officers in introducing a satisfactory system of irrigation.

6. An endeavour was in the first instance made to follow, as far as the law admitted, the system adopted in the Upper Provinces. There no written application for water is necessary, but, an outlet once fixed, cultivators are, subject to a system of rotation as regards supply, permitted to take water much as they please. The discharge of the outlets of a village are fixed and ordinarily do not admit of more than one-seventh of the cultivated area being under *kharif* crops requiring canal water. If a greater proportion is so cultivated it is at the risk of the villagers, who are consequently careful to limit the cultiva-

tion within the area for which the supply allowed is in dry years, with the utmost economy, sufficient.

In Bengal no attempt was made to limit the area to be irrigated in any village, and whilst written applications were required, but little care was taken to restrict the supply of water to the areas included therein. The departmental arrangements failed to provide against waste and against the water finding its way to the lands of other persons than those who had applied for it. The cultivators themselves took little thought in the matter, but relied on the supply which was enough for rice transplantation being equally sufficient for maturing the crops originally watered, irrespective of rainfall. If no rain fell in the *kaliya*, not only was more water required for crops already irrigated, but there was a further demand for rice sown on low lands, which then also looked to the canals for a supply sufficient to save the crop.

Whenever the supply of the outlet did not suffice for the entire area requiring irrigation, the complaint was of 'deficiency and irregularity of supply.' If rain fell whilst the crops were being or had lately been watered for the first time, disputes arose as to whether water-rates were leviable. The objection was emphasized when the fields assessed were not included in a written application since the case then became one of 'unauthorized irrigation.'

7. The recommendations made by the Committee involve not only changes in the system of administration followed, but reductions on various grounds in the sums charged as water-rates. It is argued in the report that the experiments yearly made as to the yield of crops irrigated by the canals and other means cannot be relied on, that the productive powers of certain descriptions of soil deteriorated after canal water had been used for a few years, that crops produced by the aid of canal water are inferior compared to those yielded on lands irrigated from *aharas*, and that the natural irrigation facilities formerly available had been destroyed or injured by the canals. Those were points which could only be satisfactorily investigated by an officer who could devote his whole time to the detailed investigations necessary and under whose directions a complete series of crop experiments could be carried out.

8. The services of a covenanted civilian, Mr. Luson, were made available. That officer had previously acted as Joint-Magistrate of Shahabad, and was at the time of his deputation Officiating Collector of Gya: so that he already possessed some knowledge of the districts traversed by the canals, and was therefore at once, when relieved on the 21st October 1889, able to commence the detailed work required. His report is dated the 29th March 1889. There was a total failure of the *kaliya* and *chitra* rains in 1888—in fact there was practically no rain from the 7th of September to the 29th of November, so that the strain on the canals was as great as it is possible that it can ever be in future, affording an excellent opportunity for determining the area they can satisfactorily irrigate under the most unfavourable circumstances. There has again in 1889 been a partial failure in the autumn rains, so that the result of two years' irrigation operations, in which the most prominent errors originally committed had been corrected, can be considered. Colonel Harrison spent October 1888 and May 1889 in studying the subject on the spot.

9. There were, however, certain defects brought to light by the Committee which admitted of reform at once. The chief of these were the failure of canal officers to exercise sufficient control over the supply of water through the outlet, and to take effective measures to prevent irrigation without permit. With the approval of the Chief Engineer, the Superintending Engineer, on the 21st of March 1888, issued circular orders pointing out in what respects an alteration in practice was required, and also in what points sufficiently minute attention had not been paid to the law and the rules. Canal officers were directed, when at head-quarters, to receive complaints daily and to register each complaint separately, though several might be received on the same day from the same village and raising objection to the demand for identical causes. Instructions were given that five-year leases were not to be granted unless proper village channels actually existed when the lease was sanctioned, and that even the deposit of funds for their construction would not be accepted as a sufficient compliance with the rule, since from various reasons there might be delay in completing them. Directions were given

that the position and size of the outlets from which water was to be supplied should be endorsed on the permit. No alteration was to be made in the capacity of any outlet during the currency of the lease. The orders regarding unauthorized irrigation were of a nature to almost entirely stop assessments under that head. It was required that 'benefit' should be established, and also that the person by whose act or neglect the unauthorized irrigation occurred could not be identified. Assessment was prohibited where canal servants were at fault, or where unauthorized irrigation was effected from *aharas* filled or partly filled with canal water. The responsibility of the Canal officer for the supply through the outlet was affirmed, and permits were directed to be refused where the blocks proposed to be leased were so situated that unauthorized irrigation was probable. It was directed that a discharge through the outlet sufficient only for the area to be irrigated should be arranged for. Attention was invited to the desirability of obtaining the signature of the *lambardar* to the shudkar or register of irrigation when the first watering was completed.

These orders were sufficient to rectify the chief defects pointed out by the Committee, and their enforcement has almost put a stop to complaints regarding 'unauthorized irrigation,' in respect of which most feeling had been shown. They suffice to justify the work of the Committee and the utility of most of its recommendations. Moreover, though the rainfall during the two following seasons was scanty, the supply of water was, with few exceptions, admittedly sufficient. Thus the causes of the complaints made before the Committee regarding the proceedings of assessing officers were completely or nearly completely removed. The Collectors concerned took similar precautions to prevent the continuance of abuses on the part of the collecting staff.

10. The point in which the greatest interest was manifested is the rate to be charged for rice irrigation. The present charge for annual leases is Re. 1-14, while for leases for five years the charge is Re. 1-4 per bigha or Rs. 2 per acre, and it is recommended by the Committee that this latter rate shall be reduced to Re. 1 per bigha and that of the annual lease shall also be modified. In a pamphlet on the subject, written by the Secretary of the Landholders Committee, lately issued, this reduction is described as being "the most important, and without which, in the words of the Commission, no improvement will be accepted as an adequate outcome of the results of the Commission." The grounds on which the reduction is advocated are those described in paragraph 7 of this Resolution, and are thus summarized in paragraph 276 of the Report:—

In deciding this question, all the circumstances of the *Sone* irrigation must be considered. It must be remembered that canal irrigation is unpopular. It is alleged that *Sone* water is injurious to the soil, to man and beast. It must never be forgotten that an old system of irrigating from *aharas* and *pynes* prevailed before its introduction, which the ryots declare was more beneficial to them than the present system which has superseded it. It is admitted that well irrigation is more beneficial to the crops than canal water. The country is said to be water-logged; the health of the people is said to have suffered. The vigorous and often injudicious assessment of water, combined with the energetic realization of the existing rates has embittered both *zamindars* and *ryots*.

11. It is probable that the Committee were right in supposing that, at the time when they made their enquiry, there was considerable bitterness of feeling both in regard to the assessment of unauthorized irrigation (which has since for practical purposes been abandoned), and in regard to the rigour with which, owing to arrears having been allowed previously to accumulate to a most injudicious extent, collections had recently been enforced. This bitterness has, owing to the reforms recently introduced, now subsided, and a careful consideration of all the circumstances in the light of Mr. Luson's enquiry of subsequent experience, and of the opinions of the local officers, convinces the Lieutenant-Governor that in the paragraph above quoted the Committee were to some extent misled upon questions of fact, and that the recommendations which followed are consequently not such as the Government should accept.

So far from canal irrigation being unpopular, the area irrigated, in the *khurif* season of 1887-89 was only circumscribed by the quantity of water available. During the current year, 1889-90, the demand has been practically of the same character. Despite the lapse of five-year leases for 65,500 acres, the area so leased has increased. The area for which leases have been cancelled, though no single application has been refused, is altogether insignificant. In the face

of these facts it is difficult to see how canal irrigation can still be considered to be unpopular.

The experiments in regard to *good* crops conducted by Mr. Luson, by Messrs. Burrows, Thomson and Mylne, and the Canal officers, show that crops exceeding 30 maunds of paddy per acre are produced from all varieties of soil, including *ketwal*, which was stated to be injured by canal water. These crops were produced on land which had been under irrigation almost since water from the canals was available. The estimate by an independent officer of the average crop of paddy on the irrigated land in 1888-89, when at the most critical time there was no rain to assist the canals, was 18 $\frac{1}{2}$ maunds, or two maunds per acre of paddy in excess of the results arrived at by the annual series of experiments carried out by Canal officers, and affords strong corroborative proof of their substantial accuracy. It is at least doubtful whether well irrigation is more beneficial than canal irrigation except for opium and barley; and the consideration has no weight in regard to *kharif* crops, which form two-thirds of those irrigated from the canals: *kharif* crops are not irrigated from wells.

12. In the preceding paragraph reference has been made to facts and figures which conclusively show that canal irrigation is not unpopular and that it is not injurious to the soil. Its advantages compared with irrigation from *aharas* will now be briefly adverted to. There are doubtless places where irrigation from *aharas* cannot be so conveniently effected since the canals came into operation, but there are also others, far more numerous, where, provided the *ahara* is kept in repair, the cultivator can still exercise a real choice in the matter. As stated in the quotation contained in paragraph 43 of the Chief Engineer's note, the constant and ample supply of water available from the end of June to October presented advantages over the uncertain supply from *aharas*, which failed either in the beginning or close of the season. The facility offered for early sowings should not be lost sight of. Even where, as in the exceptional case of Belgaon, an efficient *ahara* provided with masonry escapes existed, the cultivators, who are themselves the contractors and who have used canal water since the beginning, have hitherto preferred to subject themselves to a heavy yearly tax for the convenience and regularity of canal irrigation. There are in the three districts few *aharas* so efficient as the one at Belgaon, and the records of the criminal courts and the experience of former Civil officers show that there was no more frequent cause for riots and affrays than quarrels over *aharas* and *pyne*s. If, on the whole, it is advantageous for cultivators occupying lands commanded by such an *ahara* as that at Belgaon to take canal water, how much greater must be the benefit where, as in the majority of cases, the *ahara* has a small gathering ground and is commonly inefficient because it is not kept in repair owing to the expense which must be incurred.

The water contained in the *aharas* is stagnant, and therefore like canal water, practically pure. It does not, even for barley and opium crops, possess the superior qualities which, it is not denied, for these crops only can be claimed for well water, especially where the well is old.

The *aharas* certainly impound water, which should not be the case with properly aligned canals, and must have considerable influence on the water-logging of which complaint is made. Malarious fever is as rife in the unirrigated portions of Gya and Shahabad, more especially Babocah, as in those irrigated, and the canals are certainly of use in supplying man and beast with pure drinking water for which no charge is made.

13. Of the reasons alleged by the Committee for reducing the water-rate, many have little real bearing on the point. If the system is at fault, it should be altered where defective; if individuals are to blame, they can be punished; but, even if true, the allegations made are not relevant to the point at issue. The public health is a matter of the highest importance, and it is right that such remedial measures as are practicable should be taken, but it does not follow that special advantages should be given to that portion of the community who use canal water and pay water-rates. It is certain that, except in a few cases, the fact of canal water being available more than compensates for injury which occasionally may have accrued to individual land-holders owing to *aharas* on their property being rendered less efficient, and in probably more numerous cases the extra supply of water poured over

the country has increased the efficiency of *aharas* belonging to the same or other proprietors.

14. In the pamphlet, written by Baboo Kandhji Sahai, it is even alleged that, compared with 1874, the import of piece-goods into Shahabad has fallen off, and that this fact indicates a deterioration in the material condition of the people, the result, it is implied, of canal irrigation. The assertion is made on the strength of statistics extending over four months only. A reference to the table, contained in paragraph 138 of the Chief Engineer's note, giving complete figures for 18 years, shows that within this period the imports have doubled. The increase has been very steady throughout this period with two exceptions only: about the year 1882 there was a slight falling off, and in 1886-87 an abnormal bound upwards.

15. The considerations enumerated in the quotation from the Committee's report in paragraph 10 above might have weight in determining the question whether a system of canal irrigation should be introduced for the first time or not, but they have little bearing on the question of what price should be charged for water when such a system has for years been in full operation. The water-rate to be charged should clearly be fixed as nearly as possible at the sum which, taking one year with another, the cultivator finds it profitable to pay. The experience gained, which is fully set forth in the Chief Engineer's note, shows conclusively that existing rates, so far as *kharif* crops are concerned, are not too high, and that it would be an injustice to the general tax-payers to burden them with the deficiency in the public revenue which would result from any lowering of the rates mentioned.

16. It is at the same time recognised that any increase in rate which might possibly be justified by the increasing demand for canal water would at the present time be unwise as calculated to lead to undesirable friction with the cultivators who have become habituated to its use. His Honour has, therefore, determined to keep the rate for *kharif* irrigation on long leases at its present figure, Re. 1-4 per *bi ha* or Rs. 2 per acre, but to extend the term of the leases from five to seven years and to give an undertaking that no increase shall be made in this rate in respect to leases entered into before the close of the year 1895-96. This favourable rate will, however, only apply where the channels are in good order and the waste of water small. For annual leases the rate will be Re. 1-14 per *bigha* or Rs. 3 per acre, as at present. There will be cases where the cultivators will be unable, for some time, to comply with the conditions which it is necessary should be fulfilled if Government is to be bound to supply water for so long a term as seven years, and to meet these it is contemplated, though the Lieutenant-Governor is not in favour of differential rates, to charge Rs. 1-9 per *bigha*, but not to give leases for more than three years.

17. Modifications all in favour of the cultivator will be made in the case of *rabi* leases, involving a reduction of from 20 to 40 per cent., in the hope that the supply of water now running to waste in that season will be more generally utilized. The arrangements under which water is given for sugarcane will be revised with the view of more precisely defining the conditions under which water is supplied for that crop, and where the consolidated yearly rate is paid remissions will be allowed if the crop fails, whether such failure was due to the deficiency of canal water or not. Provision will be made for the supply of water by volume in October to unleased areas should a surplus be available after all leased areas have been fully watered. Under certain conditions, canal water will be supplied to *aharas* between November and March.

18. The rules will be amended providing that in the *kharif* season water will only be supplied to associations of ryots cultivating blocks of land to which water can be supplied without the probability of unauthorized irrigation occurring. The selection of the block, under certain restrictions, will, as recommended by the Committee, be left to the canal officer, who will be allowed to exclude land not commanded by the canal without special arrangements or not irrigable by flow. The canal officer will be required to specify in detail, in the permit, the size of the outlet and the approximate discharge, and to be responsible for the supply through the outlet. The discharge through the outlet will be mainly determined with reference to actual experience in 1888, when there were no autumn rains. The *tatil* will be limited to five days after ten days' consecutive supply.

The assessment of lands irrigated beyond the boundaries of the leased area will be absolutely and entirely prohibited, though power will be reserved to cancel leases, on the joint authority of the Superintending Engineer and Collector, where water is habitually wasted or misused. Where unauthorized irrigation occurs, not by water being abstracted from leased areas, but through a village channel being cut or a criminal offence committed, the Canal officer will be permitted, with the previous sanction of the Collector, to impose water-rates under section 79 of the Act. In this case, and in this case only, where the facts will be placed before an independent tribunal before any measurement is made, will any assessment for unauthorized irrigation be allowed in the *kharif* season.

The Committee recommend that no change shall be made in respect to the present method of assessing *rabi* irrigation, regarding which complaints were not received. This recommendation is accepted.

19. The non-assessment of unauthorized irrigation materially affects the subject of objections to demand. The cases in which most exception is taken to canal officers dealing in the first instance with complaints are those in regard to unauthorized irrigation. In no others are appeals ordinarily preferred. The remainder relate to errors in demand, and the decision arrived at is usually at once acquiesced in by the complainant. Many of them refer to changes in occupiers disposed of by alteration statements, the preparation of which will in future be entrusted to the Deputy Collector. Nearly half the complaints made are at once decided in favour of the complainant, and the demand statement is now generally corrected before it is sent to the Collector for realization. It would obviously be a hardship in these cases to require the complainant to prefer his objection at a different office from that in which the demand statement is prepared. But it is only in the sense of giving the sub-divisional canal officer an opportunity of correcting his assessment that the Lieutenant-Governor proposes to leave the disposal of objections with canal officers. The appeal will be direct from the sub-divisional canal officer to the Collector. It will, however, be required that reasonable expedition shall be used in preferring the complaint in time to admit of a satisfactory investigation being made. The *lambardar* and subordinate canal officers will further be required to bring to notice cases in which objections are likely to be taken, so that such may be enquired into before the crop is cut or the demand statement prepared.

20. In regard to minor matters the recommendations of the Chief Engineer are accepted. The cost of road crossings for village channels will in future be borne by Government. Minor distributaries will be provided in lieu of long village channels, and leases for land at too great a distance from the distributaries will not be accepted. The Superintending Engineer will be required to specifically define the areas within which water is available for irrigation in various seasons. He will also be required to advise the Collector in the case of appeals regarding village channels, or when a permit is refused owing to the unsuitability of a block. The joint and separate liability clause in long-term leases—an arrangement to which great objection was taken by the Committee—will be abolished. Selected landholders will be supplied every year with a copy of the Revenue Report, and invited to submit any suggestions they may desire to make for the improvement of the administration for the consideration of Government. The magisterial powers already conferred on canal officers will not be withdrawn, but in future all Engineers will be required to pass an examination before being so vested. The desirability of prompt orders being passed in cases where extraordinary remissions appear to be called for is recognized, and the Superintending Engineer in this respect will be vested with limited powers to be exercised without previous reference to Government. Water will, as already indicated, be supplied during certain months of the year to *ahars* on payment. The dates for the payment of water-rates have been fixed so as to be convenient to the cultivators, and payment by instalments in certain cases allowed.

21. The measures narrated in the two preceding paragraphs have as their main object the protection of the cultivator. But whilst desirous of securing to the ryot a full supply of water at proper times and on reasonable considerations, it is necessary that means shall be taken to secure payment of water-rates justly due. There are cases of villages where realizations are never made with-

out coercive processes of one kind or other, and power will be taken to shut off the supply of water to such villages altogether until all arrears are paid up, and in extreme cases to prohibit further supplies unless half the amount which will become due as water-rates is paid in advance. These extreme measures will be adopted only with the joint approval of the Collector and the Superintending Engineer.

22. On the important question of transferring the execution of certificates from the Special Deputy Collector to the regular Revenue establishment, the Lieutenant-Governor finds a great difference of opinion between the Collector and the Board on this subject. He has no doubt that the Board's view is in accordance with the intention of the law and should be carried out. The Board will be asked what changes in establishment are necessary for giving effect to the decision, and how the delay, &c., anticipated by Mr. Power can best be obviated.

23. The changes noted above will not be introduced without some loss to Government. The charge for water under long leases is much less than that charged under annual leases, and the growing popularity of the former has already had a marked effect in diminishing the supply of water available for the latter, and thus reducing the assessments. The lower rates for *rabi* will probably in the end be recouped by the increased area regularly irrigated; but for two or three years at least there will on this account be a diminution in the receipts.

The Lieutenant-Governor accepts the opinion expressed by all the local officers that in some shape or other fees must be paid for the duties performed by the *lambardars*, and also the recommendation contained in the Chief Engineer's note as to their amount and the duties for which they are to be payable.

Circle officers will be replaced by *zilladars* permanently appointed, provided no increase in the expenditure hitherto incurred on collecting establishment is thereby caused. It appears to His Honour that, despite the extra work thrown on the collecting establishment by the powers it is proposed to vest in the Deputy Collector to sanction alterations, and, in certain cases, remissions in demand, the spread of five-year leases involving to a large extent fixity of demand should admit of some reduction in the establishment formerly necessary. Some saving will result by the substitution of fixed fees for a percentage in cases where *putwaris* are called on to render assistance in the matter of assessments.

Drainage works, estimated to cost Rs. 2,82,271, have been sanctioned from 1884-85 to date, and investigations in regard to works still reported to be required are in progress. A statement showing all cases in which it is possible that drainage may have been interfered with is contained in Appendix I to the Chief Engineer's note; in but few of the instances mentioned have remedial works not been carried out, and in these cases investigations are in progress.

The magisterial powers vested in some of the canal officers have admittedly been but sparingly exercised; and though the Lieutenant-Governor is, on general principles, opposed to permitting canal cases to be dealt with except by the ordinary tribunals, he is unwilling to weaken the hands of canal officers in times of great demand for water.

24. The rules under Act III (B.C.) of 1876 at present in force will be amended in the sense indicated in this Resolution and forwarded to selected officers for opinion. The replies received will be considered and draft rules published in the *Calcutta Gazette* for general criticism before being enacted under section 99 of the Act.

25. The Committee make certain proposals for changes in the law. These are mainly that an application for water by a large majority of interests in a given block should bind the minority; that the law should bind the *zemindar* in *bhaoli* tenures to share, either directly or indirectly, the burden of irrigation charges; that the water-rate should be declared an encumbrance on land of the same character as rent: in other words, that it should be binding on the applicant's successor in interest. These three recommendations have the Lieutenant-Governor's concurrence, but legislation to give effect to them requires the approval of the Government of India, and the question of revising the law on these as well as on other minor points will be separately dealt with.

26. It will be seen that the great bulk of the Committee's recommendations have been accepted either wholly or in part; that in some the object

aimed at has been secured by a modification of the proposed methods, and only in regard to the rates charged for *kharif* irrigation has the Lieutenant-Governor been obliged altogether to reject their recommendation. The work of the Committee has not been unfruitful; it has, on the contrary, been of the highest value, and the thanks of the Lieutenant-Governor are due to Mr. H. J. S. Cotton, c.s., the President of the Committee, and to Mr. C. W. Odling, M.E., M.I.C.E., and Rai Jai Prakash Lall, Bahadur, Members, for the care with which they have carried out their investigations, and especially to the President for the very lucid report submitted. The Lieutenant-Governor also desires to record his thanks to Colonel Harrison, late Chief Engineer, for the valuable note submitted by him on the report.

His Honour further recognises the assistance rendered by the Maharaja of Doomraon in providing the Committee with facilities for carrying out their enquiries.

Special thanks are due to the firm of Messrs. Burrows, Thomson and Mylne for their co-operation in the crop experiments carried out, and for a long course of assistance to the Irrigation Department, in no way interrupted by the criticisms they considered it their duty, in the public interest, to make on the system of administration pursued.

Sir Stuart Bayley notices with pleasure the very thorough manner in which Mr. H. Luson, c.s., carried out the enquiries committed to him.

27. The Chief Engineer has selected from amongst the names mentioned by the Committee those of Mr. L. H. Mylne, Baboo Kandhji Sahai, B.A., B.L., Mr. W. A. Inglis, and Baboo Sharada Prosad Chatterjee as having, both during and subsequent to the Committee's proceedings, rendered valuable assistance in arriving at a satisfactory solution of the difficulties which led to the appointment of the Committee. To the gentlemen mentioned above and in the Committee's report, and to all others who, though not specially named, aided in the enquiry, the acknowledgments of Government are due.

ORDER.—Ordered—

1. That a copy of the Resolution and the Chief Engineer's note and Appendix I be published in the *Calcutta Gazette*.

2. That a copy of this Resolution, of the Committee's report and of the Chief Engineer's note thereon, and all attached papers, be submitted to the Government of India in the Public Works Department for information.

3. That a copy of this Resolution and the documents referred to therein be forwarded to the Appointment, Judicial, Financial, Revenue and General Departments of this Government; to the Board of Revenue, Lower Provinces; to the Commissioners of the Burdwan and Orissa Divisions; to the Superintending Engineers of the South-Western and Orissa Circles, and to the Director of Land Records and Agriculture for information.

4. That a copy of this Resolution and the documents referred to therein be forwarded to the Commissioner of Patna; the Superintending Engineer, Sonb Circle, and the Collectors of Shahabad, Patna, and Gya, for information and guidance.

5. That a copy of this Resolution and the Chief Engineer's note be sent to Mr. H. J. S. Cotton, c.s., to Lieutenant-Colonel C. W. I. Harrison, B.A., to Mr. C. W. Odling, to the Maharajah of Doomraon, to Rai Jai Prakash Lall, Bahadur, to Messrs. Burrows, Thomson, and Mylne, and to Mr. H. Luson, c.s., with reference to paragraph 26 of the Resolution.

6. That a copy of this Resolution and the Chief Engineer's note be sent to Mr. L. H. Mylne, to Baboo Kandhji Sahai, B.A., B.L., to Mr. W. A. Inglis, and to Baboo Sharada Prosad Chatterjee, with reference to paragraph 27 of the Resolution.

By order of the Lieutenant-Governor of Bengal,

J. M. McNEILE, Col., R.E.,

Secy. to the Govt. of Bengal,

P. W. Dept.

NOTE BY LIEUT.-COL. C. W. I. HARRISON, R.E., CHIEF ENGINEER, BENGAL, ON THE REPORT OF
COMMITTEE APPOINTED TO ENQUIRE INTO THE ADMINISTRATION OF THE SONE CANALS,
DATED 14th JANUARY 1890.

(1). In a Resolution No. 18847, of date the 11th November 1887, issued by the Public Works Department (Irrigation Branch) of this Government, a Committee was appointed to enquire into the allegations contained in a memorial numerously signed by many of the leading residents and landholders of the Shahabad district, complaining of imperfections in the system of assessing lands irrigated by the Sone Canals, as well as of oppression in collecting the water-rates charged. It was also alleged that injury had been caused to the general health of the district by obstructions to drainage caused by the canals and distributaries, and other causes of complaint were mentioned. A copy of the Resolution was forwarded to the members of the Committee—Mr. H. J. S. Cotton, C.S., President, and Mr. C. W. Odling, C.E., and Rai Joy Prokash Lal Bahadoor, members—with a letter No. 18867, dated the 11th November 1887, in which the complaints made in the memorial were detailed, as well as probable faults of system which had been brought forward by officials, and the remedies suggested.

The Committee was instructed to report on the points noted below—

I.—All classes of complaints and erroneous procedure which are brought to notice either in the memorials or in the various memoranda and reports submitted to them.

II.—The following points on which questions have arisen in the course of working the Act.—

- (a)—The definition of a village channel.
- (b)—The liability to water-rate as affected by the use of the words "supplied through a village channel" in sections 79 and 80 of the Irrigation Act.
- (c)—The alteration of section 74 of the Irrigation Act.
- (d)—The necessity for legislating for a more summary mode of realizing water-rates than is permissible by the Certificate Act.

III.—The great difficulty experienced in arranging for a proper distribution of water and assessments on irrigation in the absence of village channels and the mode of overcoming this.

IV.—The advisability of making any changes in the existing system of assessments and collection, and of the distribution of duties regarding the assessments and supply of water between the Engineer and Revenue officers. In connection with this, it should be considered whether, since the professional establishment would still have to be maintained at about its present strength for the work, it would not be a waste of strength to abstain from utilizing their services as far as this is possible in the interests of the public for other branches of canal work. Moreover, the gradual and steady progress which is brought out by the reports and notes of the Canal officers should have its due weight in determining whether such progress does not point to its being preferable to build up and improve the existing system, with its gradual growth of ten years, rather than to aim at an entire change.

V.—Changes in the rules to remedy the defects brought to light by the various complaints.

VI.—The necessity for further provision for drainage and in connection with this the effect of altered conditions under which the "ahars" now hold water all the year round, instead as formerly for only a few months, to which reference is made in paragraph 10, clause (1) of the observations; and whether any practical remedy can be found for the difficulties connected with the "ahars."

It was stated that the Lieutenant-Governor hoped that three months would suffice for the completion of the enquiry and submission of the report.

(2). The enquiry was as directed carried out as expeditiously as possible, and the report is dated the 13th March 1888. It is signed by all the members of the Committee, subject, however, in the case of Mr. C. W. Odling, to a dissent dated the 31st March 1888, and in that of Rai Joy Prokash Lal Bahadoor to a dissent, dated the 4th April 1888. In both cases the reservations embodied in the dissent are material, and the report may be taken to be that of the President, Mr. H. J. S. Cotton, C.S., supported, however, in many respects, chiefly as regards the recommendations for the future, by the departmental member of the Committee.

(3). The report was forwarded to the officers mentioned in the margin for criticism. The date of their replies is noted. The Revenue Secretary, the Hon'ble Mr. N. C. Chatterjee, who had been Collector of Shahabad from 10th May 1880 to 3rd March 1885, was, by order of the Lieutenant-Governor, specially asked to comment on the report, and has furnished the most valuable note, dated the 10th July 1888. Mr. L. H. Mylne, Beharra was also good enough to forward for consideration a number of remarks on the report, dated the 1st June 1888. As the firm of Messrs. Burrows, Thomson and Mylne had much experience in the matter of canal irrigation, and have invariably endeavoured to co-operate with the canal officers in regard to improved arrangements for distributing water and in other matters the opinions expressed by Mr. Mylne are specially valuable. The notes of the Engineers were mainly replies to the remarks made by various witnesses.

(4). As might have been expected, the proceedings of the Committee and their report not only brought vividly to the notice of the canal officers the grievances it was alleged that irrigating cultivators had suffered at their hands, but also threw light on weak points in the system pursued, more especially those in which the exact provisions of the law had not been observed. The season 1888-89 proved to be one in which the rainfall, though abundant, was not, as regards the rice, well distributed, and the Superintending Engineer, Sone Canal, who, in Bengal Government orders No. 18217, of the 11th November 1887, had been informed, in reply to a suggestion that effect that the services of a civil officer would, under circumstances render it desirable, be placed at his disposal, asked that a junior civilian might be appointed to report on the state of the irrigated crops and on certain other points. The officer selected, Mr. H. Lusop, C.S., who had previously acted as Joint-Magistrate of Shahabad, and who was at the time Officiating Collector of Gaya, commented his enquiries on the 24th of October 1888, on the termination of his appointment.

Board of Revenue, Lower Provinces, 25th June 1888.
Collector of Shahabad, 31st August 1888.

Baboo Baroda Prasad Chatterjee, Special Deputy Collector, 25th May 1888.

Mr. W. A. Inglis, Executive Engineer, 21st June 1888.

Mr. D. B. Horn, Executive Engineer, 2nd July 1888.

Mr. H. B. Frost, Executive Engineer, 16th July 1888.

Mr. C. A. White, Assistant Engineer, 6th July 1888.

Baboo K. C. Banerjee, Sub-divisional Officer, 3rd July 1888.

Mr. K. H. Stephen, Executive Engineer, 20th June 1888.

Mr. H. Barlow, Assistant Engineer, 4th July 1888.

Mr. M. H. Arnott, Assistant Engineer, 2nd July 1888.

Mr. Lusson submitted a preliminary report on the 5th of November 1888, which was published in the *Calcutta Gazette* on the 9th of January 1889, as an appendix to a note by the Superintending Engineer, Sone Circle, dated the 14th of November 1888.

Mr. Lusson himself carried out a large number of experiments as to the yield of the irrigated crops, and a note by him dated 4th February 1889, on the subject was published in the *Calcutta Gazette* for the 3rd of April 1889.

This note embodied not only the results of the experiments carried out by Mr. Lusson himself, but those carried out by officials and by Messrs. Burrows, Thomson and Mylne, and, with their usual public spirit, rendered all the assistance in their power.

Considerable public interest was evinced in the progress of the Committee, and the landholders and others associated themselves together to render such assistance as they were able in bringing forward evidence of grievances complained of, and suggesting remedies for the same.

The Secretary of this Co-operating Committee has published a pamphlet, of which I received a copy on the 1st of June 1889. The pamphlet mentioned above may, in connection with the dissent of Rai Joy Prokash Lal Bahadur, be taken as the statement of the case which commends itself to the landholding portion of the community.

The report on the revenue administration of the Sone Circle for the year 1888-89 was received on the 14th of November, and contains statistics and general information regarding the progress of irrigation during the year. In the same time, another *kharif* season, 1889-90, in which the late season was essential for the proper maturing of the rice crops, failed, has passed away; and before this note is concluded it is probable that the Superintending Engineer, Sone Circle, will be able to furnish a report giving the main facts connected with this season's *kharif* irrigation. The weekly reports received from Canal Divisional and Sub-divisional Officers have already in a somewhat diffuse form recorded the chief characteristics of the season.

I was travelling about the Sone Canals during the latter part of the demand for canal water in 1888-89, 17th September to 2nd November 1888, in company with the Superintending Engineer and Mr. Power, the Collector of Arrah, and I spent a month (May) last year in the circle gathering further information.

The delay in considering the Committee's report in some respects possibly unfortunate, unquestionably of its being dealt with in a more comprehensive manner would have been possible if it had been disposed of at an earlier date.

(9). The report of the Committee is divided into four parts, as noted in the heads of report, Vol. I, pages 1 to 4.

Part I.—Historical and descriptive.

Part II.—Complaints against the canal system.

Part III.—Complaints against administrative procedure.

Part IV.—Recommendations of the Commission.

It will be convenient, after considering Part I of the report, to briefly refer to the provisions of the law and the system passed under it and the actual administrative system followed. Such an examination will show that the difficulties complained to a large extent arose from an endeavour to carry out rules and a system of procedure, in accordance with the Northern India Irrigation Act, which was drafted and passed on an Act differing from it in many respects and containing at least one section distinctly hostile to a very important feature in the rules and system taken as a guide. The system followed, it will subsequently be made clear, was not with a view of enhancing the revenue derived from the canals, but simply with the object of levying water-rates on those cases only where irrigation with water taken from the

canals had actually been practised, and where benefit had been reaped.

PART I.—HISTORICAL AND DESCRIPTIVE.

(10). It is unnecessary to follow the historical and descriptive account of the canals contained in the report except from two special points of view—(I) anticipated revenue, (II) crops to be irrigated.

As to the former, it must be admitted that the forecasts of revenue submitted by the Engineers who designed and carried out the works have not been realized, and that the anticipations of commercial success, which were founded on facts regarded by the Government of India as incontrovertible and accepted by the Secretary of State, have been falsified. The fact is to be regretted, but there are no grounds for believing that these mistaken estimates have had any practical effect on the canal administration.

The responsible local manager, the Superintending Engineer, has not, for many years, encouraged Government to expect more than a modest surplus over working expenses. An extra charge for establishment, imposed as a matter of arrangement between the General and Irrigation Branches of the Public Works Department, has to a certain extent vitiated his calculations, and allowance must be made for the effect of the sittings of the Committee: if this be done it will be found that his estimate has been substantially not far from correct, both as regards net revenue and area likely to be irrigated.

The latest forecast which is specially referred to above is that contained in the Superintending Engineer's letter No. 2432 of the 13th July 1886, the figures included in which were relied on in

arranging the financial contract between the Bengal and Supreme Governments for the five years commencing with 1887-88. The letter was written long previous to Sir Stuart Bayley's visit to Arrah in August 1887, and before there were any signs of the agitation which culminated in the memorial leading to the appointment of the Committee. Reference will be made to the forecast later on; here it is sufficient to say that Government deliberately accepted a moderate estimate of revenue for the five years ending with 1892-93, and that it is this estimate,*

Year	Estimated area to be irrigated—acres	Actual—acres
1887-88	825,000	825,000
1888-89	875,000	875,000
1889-90	815,360	815,360
1890-91	855,909	855,909

and not the more sanguine ones framed before any actual experience on the working of the canals had been obtained, which must be taken as the financial results that were expected.

The second point mentioned in the preceding paragraph—crops to be irrigated—will now be considered.

(11). The connection between the revenue derived from the canals and the substitution of *kharif* for *rabi* crops may not at first sight appear to be close; but in the course of this note will be made clear, and the spread of rice cultivation on lands formerly devoted to *rabi* crops will therefore be now briefly referred to.

When the canals were projected, it was assumed that, as was then approximately the case, half the area commanded would be cultivated with *rabi* and half with *kharif* crops, the former mostly filling the high lands in the immediate vicinity of the canals and distributaries, and the latter those lying at a lower level. The change in the character of the crops raised on the land—generally high—on which the canals run is remarkable. *Rabi* crops have practically disappeared. The character of the soil and the presence or absence of wells seems to have had little or no effect on this result, which was due to one cause and to one cause only—the possibility of getting a full and regular supply of water. On this point there can be no possible doubt.

as will be evident from the subjoined extract from a letter

Note on page 39, paragraph 86 of report.

from Mr. L. Mylne, dated the 31st

June 1884, commenting on the report with particular reference to its applicability to the Jugliapore estate, italics are mine.

"For the irrigation of the jungle portion there were no *aharsas*, but we constructed between 500 and 600 masonry wells which, till the advent of canals, sufficed for all the requirements of the cultivators. There was hardly any paddy cultivation."

• About 13,000 beegahs. The adoption of canal irrigation was rapid and general all over the jungle mahal, resulting after a few years in an almost entire change from dry weather to wet weather crops which could not be raised by well irrigation. The transformation has been so complete and thorough that only the absolute refusal of canal water for paddy would compel the ryots now to forego the cultivation of that crop.

† Worthy of note, as in the complaints it was frequently asserted that rice had been irrigated by wells.

(12). As stated in the report, it may be that the change has been "not altogether in the best interests of the people."

I am myself of opinion that restrictions—which would not have been popular—in the quantity of water supplied in each distributary in the *kharif* season should have been applied, and Mr. Mylne, senior, has expressed a similar view; but there

§ Vol. II, page 195.

strenuously must be decided financial advantages, or so overwhelming a change would never have been made by a people notoriously conservative in their methods of agriculture. There was no necessity for the alteration, as ample means for irrigating *rabi* crops with well water, if there were objections to canal water existed in the Behra estate.

(13). Sir G. Campbell, who was by no means sanguine of the success of the canals, was apparently just as much mistaken as the Engineers: his fear was

§ Vol. I, page 5. Latter part of quotation.

that there would not be sufficient water in the river to supply the canals with the water required for the winter crops. As a fact, there has hitherto been always enough to spare in that season; and with the view of inducing the people to take advantage of it, the Committee propose to reduce the rates for *rabi* irrigation. The exact bearing of the change in the character of the crops on the revenue derived from the canal has been that the higher sandy lands near the canals, which the projectors of the scheme anticipated would be cultivated with *rabi* crops, have been covered with rice, and the *rabi* water rates which it was expected would be realized have been lost. The water utilized in the manner described is not available for the lower lands further from the canals and more suitable in themselves for rice crops besides requiring less water. The attached map will show how concentrated the irrigation is, and how much *kharif* irrigation could be developed if the water-supply was sufficient during that season.

It is also an open question—and something more on this head will be said later on—whether the canals by increasing the quantity of drainage water have not, so far from injuring existing *aharas* used for the irrigation of rice lands, improved their supply.

(14). An extra 100,000 acres of *rabi* irrigation would make all the difference in the financial prospects of the scheme, and if in one estate 13,000 acres of *rabi* cultivation, a large part of which might reasonably have been expected to take water for that crop, have disappeared, it scarcely seems extravagant to suppose that this area alone has not only been lost, but absorbed a supply of water which could have been more profitably disposed of in irrigating lands naturally better adapted for rice crops.

From what has been said above, it will be seen that the change from *rabi* to *kharif* cultivation, which dates from after 1877-78, when *rabi* crops irrigated by canal water mostly failed, was neither contemplated nor welcomed by canal officers. It is right to distinctly traverse the statement made in the report—

Vol. I, page 10, sec. 2.

"The conviction which impressed itself on Colonel Rendell's mind that the canals must be maintained from rice cultivation

and not from *rabi* has moulded the whole subsequent policy of the department."

The action of canal officers has been limited to accepting such changes as the cultivators have in their own interests carried out; and as a matter of fact the water-rate on crops was raised by about 20 per cent. on the 1st of 1881 in the case of annual leases.

PART I A.—ACTUAL ADMINISTRATIVE SYSTEM PURSUED

(15). Turning now to the actual administrative procedure

Actual administrative system followed. 188 I.M.), provided that "every

desiring that water shall be supplied to his land from a canal shall present a written application to the Canal officer in the form given in Schedule B annexed, or in a similar form, binding himself by the rules by the Lieutenant-Governor under the powers vested in him by this Act."

The words *shall be supplied* are of doubtful meaning.

• *Vide* Vol. II, page 251. will be adverted to further

Schedule B (page 192 I.M.) obviously intended to be filled in and presented to Canal officer by individual cultivators. This is evident on inspection. The name of the applicant is put at its head, and there are columns below in the number of the fields in the revenue survey, the acreage of each field, and the crop to be grown specified. Leases for compact areas by the occupiers of various fields included in the block are not contemplated, though in practice it is only to such blocks that water is delivered. The permit Schedule C (page 193 I.M.) is a form obviously intended for issue to individual cultivators only. Sections 74 and 75 of the Act (page 188 I.M.) which the forms comprising these schedules are prescribed for, give some latitude in the matter to the Lieutenant-Governor, allowing similar forms to be enacted of the rules. The discretion thus given was taken advantage of, and the application form prescribed by rules (page 212 I.M.) which, under section 99 of the Act (page 192 I.M.), have the force of law, is for a compact block including usually the fields of several cultivators.

The signature or mark of each cultivator is required on the area, more or less, he proposes to irrigate, but the application must be presented through a *lambaradar* appointed by the applicants (in the manner provided in Rule 208 I.M.) to act on their behalf, and the permit is signed by his name. There is nothing illegal in the procedure, though dealing with associations of cultivators instead of individual ryots, is not expressly authorized by the Act itself.

(16). It has already been stated that practically water only be delivered to blocks more or less compact, and the application, instead of being for specified fields, is for more or less, in the occupation of cultivators who signed the application. The statement of water-rates except in the case of five years' leases, prepared after the area has been irrigated, and the manner in which the statement is to be effected, the demand statement prepared, published, and objections thereto decided, is entirely provided for in Rules 38 to 48 (pages 210-11 I.M.). The procedure is to some extent justified by section 78 of the Act which states that "the rates to be charged for water supplied for purposes of irrigation shall be determined by the Lieutenant-Governor, and all persons accepting the water shall pay it accordingly."

Paragraph 2 of Instructions for Canal Officers (223 I.M.) states that the "application constitutes an acceptance of water within the meaning of section 78 of the Act."

In practice, however, the actual area irrigated, lands applied for but not irrigated, not been charged. This procedure was approved by Colonel Harrison's letter No. 13841 of the 9th August 1879, contrary orders having been given by Colonel Harrison, if ever, acted on.

7). The Rules, pages 207-215 I.M., and Instructions for Canal Officers and Subordinates, pages 223-228 I.M., very much on the lines of those issued in the North-Western Provinces under the Northern India Canal and Drainage Act, in which no written application for water was required. Persons entitled to use a village channel in those provinces the right to take water whenever they pleased, and an endeavour was made to, as far as was legally possible, assimilate the procedure in Bengal to that which had prevailed in the Upper Provinces. It is stated in paragraph 1 of the instructions for Canal Officers (page 223 I.M.) that the basis of all demands is the application form, but as a matter of fact water-rates are (paragraph 3) to be levied in accordance with the *khakra* prepared by the ameen under rule 38 (page 210 I.M.). A permit is not issued, nor are any arrangements made to supply the cultivators with water on a written application has been filed. Once, however, a permit was issued, the cultivators were permitted to take water pretty much as they liked, and the actual area irrigated was measured and charged.

The past tense is used in the paragraph preceding, as being more especially since the Committee at the time of water has as far as practicable been limited to the area required for the area to be irrigated, and active measures were taken to prevent lands outside those mentioned in the application from continuing to receive water. It was in previous years held that either the area irrigated was covered by the written application, or the cultivators were liable to be charged, under rule 79 of the Act (page 189 I.M.), the water having been taken in an unauthorized manner. It is a question what is the meaning of the words in section 74 of the Act (page 188 I.M.) "that no person shall be allowed to take water from the canal or to apply it to his land with the permission of the Canal Officer," and whether aid was given to admit of lands, not covered by a permit, being irrigated, and unless water was taken from an outlet which it was necessary to keep open to supply leased lands the outlet was closed so soon as it was reported to the Canal Officer that unauthorized irrigation was in progress. On the other hand, if the definite was properly and necessarily limited, but little care was taken to prevent irrigation extending beyond the boundaries of the land for which a permit had been issued.

As the application is required to be in writing, it has been suggested that the permission must also be in writing, and that the rate definite (vol. II, page 251). The application is *de facto* treated more as a notice that water was to be taken in a certain locality than as actually giving the permission to be watered, though considerable regard was paid to the area in fixing the size of the pipes when a temporary permit was required. The applications were nearly invariably for an area considerably less than the cultivators intended to irrigate.

The instructions for Canal Sectional Officers, paragraph 5, rule 41, I.M., which distinctly forbade them to close an outlet once irregularly opened without the sanction of the Divisional Canal Officer, show clearly that it was considered more important that the supply of canal water should not be stopped than that unauthorized irrigation should be prevented.

The Canal Officer usually, before closing the outlet, gave the cultivators a further opportunity of filing an application.

It is here that the question of supply comes in. In the provision of village channel, section 3 of the Act (page 188 I.M.), the sluice or outlet through which the channel is fed is expressly excluded; it follows that the owner of the channel or the *lambardar* is not responsible for the opening or closing of the outlet, though it has been the practice in some cases to permit the cultivators to regulate the supply of water as they pleased. In fact, until permanent outlets were constructed, no other course was practicable, as the pipe was stopped with a wisp of straw which could at once be removed without difficulty. It was not possible to fix the position of permanent outlets until it was known not only what area would be required, but the average area to be

irrigated by each, so that the size of the opening required could be ascertained.

The Act throughout—sections 74 and 78 may be taken as examples—contemplates the supply of water being regulated by the canal officer, and Mr. Mylne* has right on his side when he objects to this burden being thrown on the lessees. At the same time the cultivators prefer to have the power to open and shut the outlet at their discretion without having to seek for the canal subordinate entrusted with the key.

20. In the case of unauthorized irrigation, there is no question that the first point for decision is—Was the supply passing through the outlet required for leased areas and improperly diverted to lands not covered by a permit? It will be gathered from what has previously been said that until this point was brought forward in connection with the memorial, it was seldom or ever considered. It sufficed if it could be shown that the land had been irrigated through a village channel, and that the crop had derived benefit therefrom; benefit was usually assumed if the crop were a fairly good one, and it may here be mentioned that we have lately been advised that temporary benefit is sufficient to justify an assessment. The fact is that under the system of measurement prescribed in rule 38 (page 210, I. M.), the objection would only occur in cases where liability to water-rates rather than the fact of irrigation or benefit was disputed, and such cases were not common, though perhaps those in which most feeling was shown.

The blots in the system described above, viz. (I) the transfer of responsibility for the supply through the outlet from the Canal Officer, to whom it legally appertained, to the *lambardar*, and (II) the failure, in cases of unauthorized irrigation, to take into account the *laches* of the Canal Officer in permitting a supply of water through the outlet in excess of the legitimate requirements of the leased area, though less strongly commented on in the report than other aspects of the case, are in fact the most serious faults established in the system of canal administration pursued. They are strongly animadverted on by Mr. L. Mylne, who is, I think, justified to the extent already admitted in saying that "Canal Officers shirk all responsibility in the matter of preventing 'waste' and 'unauthorized' irrigation." The word *all* should be omitted, as endeavours were always made to prevent an outlet being opened until a lease was executed, and the tendency to check and restrain irrigation without permit was each year becoming more and more fully developed.

It is possible that the *lambardar* might, even with the law as it stands, be required to close an outlet when water is no longer legitimately required for the irrigation of leased areas. Vol. II, page 181, paragraphs 5 and 6.

It was indeed becoming clear that, despite the obvious advantages of permitting cultivators to take water, as in the North-Western Provinces, when they liked, and then measuring the area irrigated, the practice led to undesirable disputes when the lands were assessed. One element of success in any such system was from the first wanting, inasmuch as an endeavour was made to supply all the irrigable lands in a village with water even in the *kharrif* season if required, whilst in the North-Western Provinces not more than 40 per cent. of the culturable lands of a village is supposed to be provided with irrigation in the *kharrif* and *rabi* seasons together. If the supply of water had been thus strictly limited the following advantages would probably have been gained. In the first place the control of the outlet could have been given to the cultivators who would most likely have taken it willingly; secondly, having this control and knowing that the supply was limited, they would have had every inducement to make it go as far as possible; and, thirdly, the limited supply would have rendered it obligatory on them to confine the irrigation within well defined limits, and thus disputes regarding assessment would have been very rare.

It is doubtful whether, unless the area to be irrigated in each village was limited, any system not involving restricting the supply in accordance with the area applied for, could continue to have been permanently followed with financial advantage to the canals or contentment to the cultivators.

The chief benefit Government reaped by the system actually pursued was that irrigation spread more rapidly than it would have done had a strict system of written applications for definite areas of lands previously measured been insisted on, and the quantity of water rigidly limited to what was required for these. The financial disadvantages to Government of the system followed were in no wise evaded. As has previously been stated, no attempt was made to measure lands for which applications had been filed, but for which water was not required.

21. The system followed was practically that led up to by the rules and instructions which had been approved by Government; and, as will be shown later on, the administration was in the main considerate, almost beyond the limits of the authority confided in the officers to whom it was committed.

These remarks apply wholly to *kharif* irrigation. It is Vol. I, page 67, section expressly stated in the report that 209. there were no complaints of unauthorized irrigation in regard to *rabi* crops.

It is perhaps as well to describe as succinctly as possible the duty which devolves on the Canal Officer under a strict construction of the Act. He is practically by the Act and rules, though not so specifically stated therein, required to supply a definite area of land with just so much water as is necessary to ensure the crop being brought to perfection, and at the same time to ensure that the supply shall be so restricted that water shall not be available for the irrigation of lands beyond the boundaries of the area leased. The quantity of water required will vary each year in proportion to the rainfall, and not only the quantity, but the time when wanted. The problem is a difficult one even in the initial stage of laying down rules, which will admit of the Canal Officer, on the one hand, as far as practicable, protecting the public interests by preventing canal water being used without payment being legally enforceable, and, on the other hand, conforming to the standard above laid down that leased areas shall receive such a full and timely supply of canal water as is required for the crops.

PART II. COMPLAINTS AGAINST THE CANAL SYSTEM.

22. This part of the Committee's report will now be considered. The Sone Canals scheme on the 1st of April 1889 consisted of 218 miles of navigable canals, 149 miles of canals for irrigation only, and 1,167 miles of distributaries. It is obvious that in constructing such a network of channels injury to private rights could not be avoided, and that inconvenience, and in some cases actual loss, would be suffered by individuals, which would not be adequately recompensed by any pecuniary compensation admissible under the law, however considerably and even liberally administered. Generally compensation beyond the actual value of the land acquired was not claimed. Whatever benefits might accrue would in the course of a few years be taken as a matter of course, whilst the injuries suffered by individuals or their ancestors would by no means be forgotten, especially in those cases where the inconvenience was still felt, such as a canal running through a village. So far as the points above mentioned are involved, and parts of the administrative system are concerned, to which detailed reference will presently be made, but which may here be stated to include, amongst other matters, 'unauthorized irrigation' and its consequence 'deficiency of supply' and the collection in a short time of heavy arrears, it may be admitted that the agitation was to a large extent real.

The complaints brought forward included both classes, those where individuals had suffered injustice, but by others where the only real grievance was that water not supplied at the valuation of the lessee.

23. Mistakes could not fail to be made by officers with no previous experience of work of the kind, and no experience in other parts of India would have enabled either the officers or engineers to deal successfully with conditions peculiar to the districts served. Frequently, as in the case of substitution of *kharif* for *rabi* crops, the conditions were such as to produce an effect of canal irrigation—only gradually developing the effect of which was not at once realized either by the cultivator or the engineer. That these difficulties were not fully met can be no matter for surprise. That efforts wholly unsuccessful were made to meet them is unreasonably admitted by the Committee in paragraph 96 of their report. It must not be forgotten that, except in the case of one or two firms, the canal authorities could count on no active aid either landholder or cultivator in preventing or detecting misappropriation of the water which had cost Government much and which the cultivator never forgot might, if rain fell, be dispensed with. The article was in fact lost as one which in the *kharif* season of the year at least was common that payment was in every case more or less of a ship to be evaded if practicable.

24. From paragraphs 15 to 21 of this note it will be seen that the rules and instructions adopted for the guidance of canal officers, though admirably adapted to the circumstances of other provinces, have not been found to be altogether suitable to irrigation as practised from the Sone Canals. Difficulties had been experienced which could not be adequately met by canal officers, and for which a thorough investigation whether by a committee or a single qualified officer, was necessary.

So far from complaining of the conduct of the gentleman who interested themselves in the matter, the memorial presented to the Governor, I am free to admit that the time for an enquiry was opportune, and that it was desirable that the landholders they should take the opportunity of which they availed themselves of putting their views on the matter before His Honour. The advantages which have resulted from the enquiry, from one point of view, can scarcely be overrated. It has placed prominently before the public the popular view of alleged grievances, and enabled the Government to remove causes of complaint which they were perhaps disposed to consider of any great importance till now unadverted on. The reforms have been effective, and it will be taken that the improvements already made are maintained.

25. It is only fair to the superior canal officers, Superintending Engineer and Collector—to say that the grievances so much complained of were never fairly brought to their notice. A communication from gentlemen in the person of Messrs. Burrows, Thomson and Mylne could neither have been lightly dealt with nor ignored. The matter is of practical importance; it is admitted that a systematic enquiry was necessary, and the redress of particular grievances but have postponed it.

26. The manner in which the enquiry was conducted may now, perhaps be noticed. The Collector of Shahabad and Hon'ble Mr. Nolan have taken strong exception to the Committee's proceedings in not having verified the statements made by properly sifting the evidence on which they were based. There is much force in the objection if the statements are to be taken as embodying anything more than the popular view of the grievances suffered. There are, however, other aspects of this question apart from the limits fixed for the completion of the enquiry. It was also necessary that the Committee should rigorously abstain from any appearance of exercising appellate or other authority over canal officers, and investigations into individual cases.

reely have failed to have led to the expectation that actual results would be passed on complaints brought forward.

27. As it was, the proceedings of the Committee interfered not only with the collection of the demands then due, which could be realized subsequently, but also with the measurements and assessments which could not be postponed. Investigations requiring the personal attendance of canal officers would have seriously interfered with these pressing duties. They were called on for reports on the more important cases, some of which, with all or nearly all the replies by the Deputy Collector and his subordinates, are printed in Volume I of the report, whilst others were received after it was submitted, and will, when necessary, be referred to in this report.

For the purposes of the Committee the method adopted was, under the circumstances, suitable, and except that possibly a few of the more important cases it would have been better to have dealt more completely with both the complaint and reply, I do not take exception to it, further than that sometimes it seems to have been forgotten, in commenting on alleged individual grievances, that it was possible that the account given of them might not be accurate, and that it was certainly unsafe to treat them as undisputed facts. It is stated in the report that replies to some of the complaints have been printed in juxtaposition with the complaints, but they are seldom or ever alluded to therein, an omission which has since been to a certain extent supplied by the reports inserted in paragraph 4 of this note.

28. The first point taken up is "CANAL VERSUS AHARA IRRIGATION."
Volume I, page 12.

It is stated by the Committee that the one aspect of the question which forces itself upon the people more than another

is that irrigation from the canals has superseded and rendered impossible within the area commanded by the canals the old system of irrigation by ahars and pyries. The zemindars complain that the canals constructed by them have been destroyed and rendered useless without the payment to them of compensation. . . . The cultivators complain that they have now to use canal water and pay for it, whereas formerly they had the ahur water for nothing. They have to pay an annual tribute of, say, eight lakhs of rupees for water, whereas formerly they were supplied with the old means of irrigation without any payment. It is true that in some cases a small amount of one, two, three or even four annas a bigha was charged from zemindars, but in many cases nothing at all was charged. . . . These are simple facts. The question is whether they are sufficiently met by the allegation that by the use of canal water the yield of paddy is larger than when the land is irrigated by other means. This answer would be a satisfactory one, if it were true that the increased yield was sufficient to enable the cultivator to pay the additional water-rate. The canal officers assert that this is so, and that experimental experiments are made every year to show the increased yield per acre of land."

It will perhaps be convenient to take up the question of the yield of irrigated crops, and then to pass on to the alleged interference with the old system of irrigation by ahars, which it may be remarked were generally inefficient and frequently useless. Such as they were they cost a great deal of labour, usually unpaid, to maintain. The Hon'ble Mr. Halliday remarks* that the administration of the ahara system of irrigation by the people themselves was a success.

29. Before discussing the subject, it is right to remark that crops were not selected for experiments with a view to establish any particular result. It was expected by canal officers at least that any set of experiments would show that the yield of rice crops regularly irrigated would exceed those which depended on the rainfall or an ahara also practically so dependent as being supplied from a catchment basin of a limited extent.

30. The result of the experiments made by canal officers Volume I, page 13, Sec. in each year up to 1886-87 is shown in a table in the Sone Canals Committee's report. In 1887-88 the results were as shown in the table below—

IRRIGATED WITH CANAL WATER.				IRRIGATED FROM OTHER SOURCES.			
Number of experiments.	AVERAGE YIELD PER ACRE.		Number of experiments.	AVERAGE YIELD PER ACRE.			
	Grain.	Straw.		Grain.	Straw.		
108	Mds. 17 a. 27	Mds. 39 a. 18	165	Mds. 10 a. 20	Mds. 23 a. 27		

The results from the year 1880-81 to 1887-88 are as follows, taking grain only into account:—

I.—Canal irrigated dhan—1,227 experiments, average yield per acre of unhusked dhan—16½ maunds.

II.—Irrigated from other sources—1,030 experiments, average yield per acre of unhusked dhan—12½ maunds.

These experiments, it must be noted, were both as regards canal irrigated dhan and dhan otherwise irrigated intended to show the yield of average crops.

31. Whilst not claiming that every experiment was conducted with such precautions as would ensure absolute accuracy, the Superintending Engineer maintains that taken together the experiments made represent "very fairly the actual state of things." It should be noted that in 1880-82 the advantage in favour of canal irrigation was very trifling; in other years it was more considerable, and the Superintending Engineer's contention is that these results are substantially correct.

32. In 1888-89 there was a general failure of the rains throughout Behar, and the good result of canal irrigation is thus described by the Commissioner of Patna:—

"The Sone Canals have been a great boon during the year to the districts irrigated by them. But for them there would have been distress and scarcity, the inevitable result of the failure of the rains in September and October. The crops generally, where canal water reached them, were good, but they failed almost entirely elsewhere."

Such is the opinion of the chief Civil Officer in the Patna Division, based on reports from district officers, which were necessarily more than ordinarily carefully observant of this point to which the scarcity in Behar had drawn public attention.

33. The above is an opinion. There are, however, solid facts to go on. It was felt, in view of the hesitation expressed by the Committee in accepting the results of experiments carried out by canal officers, that it was desirable, for one year at least, to have experiments carried out by an officer independent of the Irrigation Department. Mr. H. Luson, C.E., was the officer selected to report on this and other matters connected with the advantages or disadvantages resulting from irrigation. The Superintending Engineer asked for the co-operation of Messrs. Burrows, Thomson, and Mylne, and canal officers were instructed to invite zemindars, ryots, and others interested to attend the experiments carried out by canal officers, and, as a matter of fact, they did so, the Sub-divisional Magistrates being also frequently present. The instructions issued were that good crops should be selected, and that ordinarily the crops should be weighed on the field.

34. The results of the experiments are shown in the table following:—

Crop.	Name of officer conducting experiments.	Number of experiments.	Average yield, dhan.	Number of experiments.	Average yield, straw.
Transplanted Aghani dhan	Mr. H. Lusson, C.S.	25	Mds. 9. 33 30/11	25	Mds. 47 17/11
	Messrs. Burrows, Thomson, and Mylne	25	31 4/11	25	52 12/11
	Canal Sub-divisional Officers	25	29 5/11	25	48 14/11
Kartika dhan	Canal subordinates	138	31 30/11	138	45 18/11
	Mr. H. Lusson, C.S.	5	25 1/11	5	46 30/11
	Messrs. Burrows, Thomson, and Mylne	25	26 27/11	25	46 4/11
Broadcast dhan	Mr. G. C. Macdonald, C.E.	2	31 4/11	2	56 20/11
	Subordinate Agronomist	1	14 19/11	1	33 6/11
	Mr. H. Lusson, C.S.	2	22 2/11	2	31 23/11
	Messrs. Burrows, Thomson, and Mylne	1	23 14/11	1	36 3/11
	Canal Sub-divisional Officers	2	27 11/11	2	54 6/11
Average		261	31 32/11	263	54 32/11

The above table is abstracted from a note by Mr. H. Lusson, dated the 4th February 1889, which was published in the *Calcutta Gazette* for the 3rd April 1889, in which the whole of the experiments, whether made by himself or others, were analysed.

Of the 261 experiments made on the yield of dhan, 30 were carried out by Mr. H. Lusson and 52 by Messrs. Burrows, Thomson, and Mylne. The remainder were carried out by canal officers and subordinates.

35. The evidence recorded by the Committee is wholly to the effect that the yield of dhan is less—considerably less—half what it was under the old system, Mr. Mylne alone stating that he refrained from giving an opinion on the question because he had no data to enable him to speak positively on the subject, but adding:—

"I may state, however, that the general opinion of our tenants is that since the introduction of canal irrigation the produce of all crops has been considerably reduced."

The statements made were not infrequently emphasized by the declaration that the witnesses would be glad to cancel his five-year lease.

The evidence recorded by the Committee is, as a matter of course, to some extent at least influenced by the consideration that the witnesses were mainly the buyers of the commodity sold by the canal officers. They naturally desired to purchase at a low rate and on conditions favourable to themselves, and the unanimity of the testimony which is commented on by the Committee is, from this point of view, not remarkable. In other matters it is not infrequently found that would-be purchasers are not undesirous of obtaining what they require as cheaply as possible, and that it is not their habit to extol the merits of the contemplated purchase.

36. It may be that there is a prejudice against the use of Sone water for irrigation which has been handed down from generation to generation, but the prejudice did not, as is expressly stated by Dr. Buchanan Hamilton 80 years ago, prevent "industrious persons watering their lands from the Sone with the utmost success, though the land is poor," and it has equally little practical effect now.

The Committee remark that—

"The impression entertained by the cultivators is apparently due to their involuntary comparison of it with other fertilizing agencies of superior quality. The only way to test the correctness of the impression is by systematic experiments scientifically conducted by independent agency."

The fertilizing agencies mentioned are the river Ganges and old wells; the former is inaccessible for kharif lands

commanded by the Sone Canals, and the latter are not to any extent, if at all, for rice irrigation.

37. An attempt has been made to satisfy the demand for experiments carefully conducted by independent agency with the results already shown.

The assertions made before the Committee were to effect—

Complaints 87, 79, 92, 110, 112, 113, 136, Volume I, pages 16 and 18.

Complaints 63, 90.

Complaints 43, 63, 109, 111, 118, 117, Volume I, pages 16 and 17.

I. That abundant crops could and never were produced by land irrigated by canal water.

II. That the producing power of the land had deteriorated owing to the use of canal water.

III. That certain descriptions of soil, especially *kawal*, are not suitable for irrigation by canal water.

These allegations will now be considered in some detail in the light afforded by the experiments carried out in 1888-89.

38. The first assertion is, it is considered, sufficiently disposed of by the table already given. An average yield of 31 maunds 52⁹/₁₁ seers per acre over all descriptions of soil, and all methods of cultivation can scarcely be taken as other than positive proof that good crops can be produced, under certain circumstances, produced by canal water. In the case of superior cultivation, i.e. transplanted *aghani* dhan, the average yield was within a fraction of 34 maunds in the case of the experiments carried out by Mr. Lusson, and 35⁵/₁₁ maunds on those carried out by Canal Sub-divisional Officers, evidently, Mr. Lusson remarks, "because taking a very small number of experiments each, they were mostly able to choose the very best crops." Instances of high yielding crops producing a yield of 39 maunds and upwards per acre were not rare, the greatest yield being 44 maunds 1 seer. It must not be forgotten that these experiments were avowedly on good crops. The question of average yield may be considered in connection with rate. Here it may be mentioned that Mr. Lusson estimates the average yield of irrigated crops for 1888-89 at 18⁷/₁₁ maunds, which was 18 maunds in excess of the result of canal officers' experiments to date.

39. II.—The experiments referred to in the paragraph above were on lands under long lease. In 23 out of 25 of the experiments carried out by Mr. Lusson on the yield of *aghani* dhan "canal water had been continuously taken for nine years or more. Of the remaining two, in one canal water had been used for three years and in the other never before. The results of these two were slightly below the average of the 23."

In the great majority of the remaining experiments water had been used for seven years or upwards, Mr. Lusson concluding his remarks on this subject by observing that—

"In fact the experiments upon transplanted *aghani* dhan have been generally upon lands continuously irrigated by canal water for a number of years, and it is therefore impossible from the results to compare the results of the continued use of canal water with those for lands to which it has not before been applied."

The only possible conclusion seems to be that the benefits produced by using canal water have been so great that when once they have been experienced the cultivators are unwilling to forego them.

40. III.—Turning to the third allegation, the unsuitability of certain descriptions of soil for canal irrigation, the fault, if there really has been a falling off in the yield of fields belonging to particular cultivators—appears to be more with the cultivator than with the canal water. In the case of 16 experiments carried out by either Mr. Lusson, Messrs. Burrows, Thomson, and Mylne, or Canal Sub-divisional Officers, the average yield of *aghani* dhan grown on *kawal* soil was 34 maunds 15⁹/₁₁ seers per acre. It is true that a yield better by about 10 per cent. was obtained from 30 experiments on the

Mr. Lusson's note, paragraph 11.

own as *balmat*, but there is nothing to justify the allegation that the *keval* soil had ceased to be productive. The fact is not as stated by Mr. Luson—

From these tables it is clear that sandy soils are somewhat better for the cultivation of dhan than clayey soils; they would seem also better than loamy soils. The results are in accordance with general opinion throughout these districts. They prove also that good dhan can be grown upon clayey soils."

1. It was very generally stated by the witnesses whose evidence is alluded to in paragraphs 35 to 37 of the Committee's report that they were desirous of cancelling their five-year leases allowed to do so. The Superintending Engineer has been empowered to cancel these leases provided all the conditions apply to that effect. From the revenue report of the Sone Circle for the current year, it appears that nine only, covering 1,456 acres, had been cancelled up to the 31st April 1889, and five for 529 acres have since been cancelled. A single application has been refused, nor, provided it is made by the 26th June, before the season has commenced, would it ordinarily be declined in future. An offer by the Superintending Engineer on the 15th October 1888, to cancel a lease for 512 acres at the end of the Kurmuri distributary, to which water could not be supplied owing to the criminal neglect of adjoining villages, was indignantly refused, as it involved the loss of canal water in the year following.

2. Specific replies to the complaints quoted at pages 15, 16, and 17, Volume I, will be found in the Engineer's reports. Regarding Nos. 34 and 35, a subordinate of the Department imprisoned in 1888 for being concerned in illicitly giving water to these villages, which consequently could not be used, and in nearly every one of the remaining cases for five-year leases have been applied for. Adverting to No. 136, the following extract from a report by Stephen, dated the 20th June 1888, deserves attention:—

"Regarding the evidence quoted by the Commission in support of general opinion as to the deterioration of crops by canal water, I desire to call particular attention to the evidence of witness No. 1, Shah Mahomed Wahidudin (page 16 of report), who has been described as a respectable Mahomedan zemindar of good standing. At the very time this witness gave his evidence before the Commission, he had applied to the Executive Engineer, Eastern Division, under section 30 of Act III (B.C.) of 1870, to acquire and construct a village channel for him at an approximate cost of Rs. 400, to irrigate about 400 bighas of land, which at present is irrigated from the canal. The water-rates on the 400 bighas will be at least Rs. 500 a year. It seems to me passing strange that Shah Mahomed Wahidudin derives no benefit from canal water, and he should be desirous of introducing canal irrigation into his village when he might construct an 'ahra' with the cost of the village channel, and save the yearly tribute of Rs. 500 which he will have to pay as water-rates."

3. In connection with this subject, the only further point which it appears necessary to bring forward is the extension of rice cultivation. That this change is in some respects not beneficial may be admitted, but, as remarked by the Committee, the fact is unquestionable, and there must have been some strong reason to induce so conservative a class as the cultivators to so radically diverge from his previous course. The cause of the alteration is thus explained by Mr. L. Mylne in a letter, dated the 30th June 1888:—

"It is necessary to explain here why canal water has been appreciated by the cultivators on the Jugdispore estate, and for this purpose I wish to those remarks a tracing of this estate. It will be seen that the area is divided into two portions—

- (1) That coloured green which, under forest 27 years ago, was rapidly cleared and brought under cultivation within a few years subsequently.
 - (2) The former settled portion coloured crimson.
- In the irrigation of the jungle portion there were no ahurs, but constructed between 540 and 600 masonry wells, which, till the construction of canals, sufficed for all the requirements of the cultivators. It was then hardly any paddy cultivation.

In the second or village portion we put into thorough repair and extended existing ahurs, which had become well nigh useless, besides constructing entirely new ones.

The adoption of canal irrigation was rapid and general all over the jungle mahal, resulting, after a few years, in an almost entire change from dry weather to wet weather crops, which could not be raised by well irrigation. The transformation has been so complete and thorough that only the absolute refusal of canal water for paddy would compel the ryots now to forego the cultivation of that crop. In the settled villages surrounding the jungle mahal canal irrigation was not extended or developed so rapidly because of ahur irrigation. But when, in seasons of deficient and uncertain rainfall, ahurs failed, the cultivators of these villages made a general and persistent demand for canal water, and we were compelled to extend our system of channels to meet their wants.

The fact that an efficient canal, such as the Behen Branch, was constructed through the entire length of the Jugdispore estate, so compact as it is, was a potent factor in the development of canal irrigation and the disuse of ahurs. "Here is a constant and ample supply of water," thought the ryots, "available from the end of June to the end of October: let us give up the uncertain irrigation from ahurs, which fail us either at the beginning or the end of the season, and take canal water." It frequently happened that these villages would not apply for canal water till the ahur failed in respect of one watering. They were then supplied with canal water, and, finding that they had to pay as much for one watering as if they had irrigated throughout the season, they naturally decided to depend entirely upon canal water and forget their ahurs. The question arises—would ahur irrigation have been put aside if a small charge had been levied for one watering or for refilling the ahurs?

The case in this estate at any rate appears to lie in a nutshell. Is it credible that *rbai* cultivation would have been exterminated and *ahars* irrigation abandoned unless the yield of canal irrigated rice was satisfactory—in fact, unless the alteration involved a profit to the cultivator at least, and indirectly to the zemindar?

44. So far the yield of canal irrigated rice has chiefly been considered. The main head "Canal versus Ahur irrigation" will now be examined. A continuation of the extracts from Mr. L. Mylne's remarks will show the grounds on which canal irrigation is preferred:—

For some years past a number of these villages have managed without canal water, but the bulk of them, for various reasons, cannot. Our policy as regards these villages has been to co-operate with the ryots, by strengthening and improving the ahurs when and where they can, with confidence, forego canal irrigation, and revert to their former methods.

One of the advantages of canal irrigation has not been anywhere mentioned, that is, the comparative certainty of the supply, in most places easily accessible to canal water, for raising paddy seedlings and their subsequent transplantation. With the aid of canal water the ryot may do this work whenever it suits him and whenever the time is seasonable and auspicious, whereas formerly he was dependent upon uncertain rainfall.

45. There is a further special case quoted by the Committee which appears to go to the root of the matter, and is accordingly quoted with the Committee's remarks at length:—

• Page lxvii, Appendix III. "And in regard to a particular village, he writes:—

"I may mention here that when visiting mouzah Belgaon, one of our villages, the other day, the ryots asked me to thoroughly repair the village ahur so as to relieve them of the necessity of paying Rs. 6,000 yearly in water-rates. They have no complaint against either the assessing or collecting departments, for they have always had a full supply of water, and they pay rates without difficulty. They have entered into a five-year lease among themselves, as contractors, for nearly the whole cultivated area held by them. We are not parties to the contract. The area of the village is nearly 7,000 local bighas, and the gross yearly collections, including Government cesses and putwaris' *neg.* is Rs. 19,000. It would seem that they have begun to doubt whether, if the ahur is thoroughly repaired by us, it would be necessary for them to purchase Rs. 6,000 worth of canal water every year. The village ahur was exceedingly efficient and reliable, but fell into disrepair owing to the adoption of canal irrigation. It is probable, however, that in order to save to the village the large sum of Rs. 6,000 annually, we will put the ahur into thorough order. Our only fear is that the ryots may miss the regularity and convenience of the water-supply given by the canal to this village."

"We invite particular attention to this evidence. The village of Belgaon is one to which the Canal authorities have always pointed as a specimen illustration of the benefits conferred on the country by the canals. The outturn of rice is ample, the supply of water sufficient, and there is no friction with the Collection Department."

Here, if anywhere, it may be supposed that the ryots are contented with the present arrangement. But we now learn that in their own opinion and in the opinion of the zemindars of the village it is a matter for consideration whether the advantages of canal irrigation are not purchased at too high a price. To avoid the water-rates it is proposed to recur to the system of irrigation which prevailed before the canals were constructed."

The question which cannot fail to occur to the reader of the Committee's report is—How great must be the advantages derived from canal water when an efficient *ahara* is practically abandoned and Rs. 6,000 paid yearly for canal water? Irrigation in this village is not a thing of yesterday. Water has been continuously taken since the canals came into operation in 1876; so that the villagers, who are themselves the cultivators, have had ample opportunity of appraising the value of the commodity bought. If in such cases it is profitable to use canal water, how much more must be the resulting advantages where, as in the vast majority of cases, the *aharas* have an insufficient gathering ground and are not kept in proper order. The Belgach *ahara* is one of the very few provided with masonry escapes. There are probably not half a dozen others so furnished in the whole of the Shahabad district.

The inference is irresistible that canal irrigation must, even after the payment of water-rates, be highly profitable to the cultivators, especially to those who have not enterprising landlords like Messrs. Burrows, Thomson, and Mylne, able and willing to construct such works *aharas*, &c., as are necessary for their prosperity.

It is perhaps necessary to observe that Belgach is situated on the last reach of the Kuntaya distributary, from which water is supplied in the *kharif* season, and that the canal water used in that village could probably within a short time be equally profitably utilised elsewhere. The demand for canal water in the *kharif* season is already practically in excess of the supply. The cultivators are not improbably reckoning on canal water being available as a 'dernier resort' should the *ahara* fail. It is quite likely that such would not be the case, and that they would find that exemption from even a tribute of Rs. 6,000 a year had been purchased at too high a price.

46. Against Mr. Solano's opinion may be quoted that of Mr. Nolan, contained in a note, dated the 10th July 1884:—

"I may say that when I was Collector of Shahabad—an office which I held during the five years ending with 1884-85—no one appeared to doubt that irrigation had on the whole been profitable to the district. The system was then extending; indeed the area irrigated doubled during the period; and coincident with its extension was observable a degree of comparative prosperity clearly distinguishing the inhabitants of north Shahabad from the poverty-stricken population of the surrounding districts."

Even now the difference in the appearance of the villages on the Patna-Gya Railway and the Patna Canal cannot fail to strike the most casual observer, and Mr. Solano's practice does not, from the following extract from a report by Mr. Stephen, appear to be in accordance with his recorded opinions:—

Irrigation from ahara.—I am not aware, with one single exception, of any *ahara* which have been destroyed by the canals in the Gya district. More than 75 per cent. of the lands irrigated from the canals are very high and cannot be irrigated by flow from *ahara*. These lands are all now sown with rice, whereas formerly only inferior crops such as *rahar*, *kodo*, &c., were grown on them. Where *ahara* water has been abandoned by the ryots for canal water, it is because they prefer canal water and can depend on a constant supply. Last year it was at the special written request of Mr. G. L. Solano, of Arwal, that I executed a five-year lease in, and supplied water to, village Buggora, pergunnah Arwal. This village in former years used to take canal water and had a five-year lease, but in 1886-86 and 1886-87 it was unable to get water, as the village is situated far down the Malli distributary. There is an *ahara* in this village. In a second village of Mr. Solano's, Pooras, where also Mr. Solano asked for a five-year lease, I was unable to grant the lease as I could not supply water to the village, it being situated very far down the Bhogwan distributary.

47. The complaint that *aharas* were injured by the canals and that no compensation was paid, is supported by specific instances only—

- I.—That of the Ghosia bund. This embankment was ordered to be cut by the Collector on the provisions of Act II (B.C.) of 1880, dangerous to life and property, not provided with masonry escapes and not protected by embankments higher up the Kao, the embankments having disappeared. There would have been a strongly contested legal question as to the compensation payable and the persons liable when the zemindar himself settled the matter by altogether declining to receive any compensation which might be charged to the public revenues. The removal of the embankment had no immediate connection with canal irrigation. The liberality and good spirit displayed by the zemindar in the matter were cordially acknowledged by Sir A. B. Halliday.
- II.—That of the Domraon bund which was removed by the Maharajah himself as dangerous to town, when all the bunds across the Kao, and it, by which it was formerly in some measure protected, had been abandoned. There was always the risk of a breach, in which case town would have been flooded.

The Superintending Engineer's statement that no action has been taken by Canal officers in reference to *aharas* with the exception of the two mentioned above can scarcely be impugned, though it is not denied that in many cases inconvenience, occasionally even actual loss, resulted from the construction of canals and distributaries. Such injuries as were occasioned from 10 to 20 years ago, and compensation should have been claimed at the time. It is impossible now without careful enquiry whether compensation was paid in all cases. There is no doubt that in some it was neither claimed nor paid.

48. One other instance, which is given as an example of how the *aharas* have been "accepted and destroyed," will be referred to under the head Drainage; and when the question of rates is discussed, it will be seen that there are strong grounds for believing that the irrigating capacity of many of the *aharas* has actually been increased by the canal water which drains from irrigated rice fields, and is intercepted by these *aharas* and again used for irrigating crops not liable to assessment.

Two other points may perhaps be mentioned—

- I.—That as regards the village of Ekwar, prominent in the report, and again at pages 22 to 50, Geo. Fox (who has been Messrs. Moran & Company's Agent since they acquired the village), states (paragraph 27 of Mr. Odier's dissent) that no application for a syphon had been made by them.

- II.—That the three villages referred to by Mr. Solano are unfortunately beyond the area which water is ordinarily available in the *kharif* season. Two of the three have, however, had one crop or more under irrigation every year, 1,328 bigahs having been watered during the four years ending with 1888-89.

49. The Sone Canals have developed into channels chiefly utilised for the irrigation of rice, not altogether in accordance with the expectations of the Engineers who designed

and, possibly, not in the best interests of the people if other than financial considerations are taken into account. It is, however, submitted that the facts brought forward show that for this purpose they are efficient, and that the contention that canal irrigation is other than voluntary, or, as compared with *ahara* irrigation, not profitable to the cultivator, rests on a solid foundation.

CANAL VERSUS WELL IRRIGATION FOR RABI.

20. The Sone Canals have so far not been successful in regard to the irrigation of *rabi* crops. These crops form approximately 10 per cent. of the area under five-year lease, and this extent *rabi* crops are probably regularly irrigated; but the annual leases which vary in amount from 15,000 to 70,000 have always been disappointing. Taking into account the year leaves the largest area ever irrigated was 129,012 in 1887-88 which is scarcely one-third of the area to which water could without difficulty be supplied. *Rabi* irrigation has never recovered from the disappointment which cultivators suffered in 1877-78. They gave it a trial, and the result, partly owing to their own inexperience and partly owing to natural causes, was disastrous. The water was easy to get and the land was flooded to the injury of the crops. There was a pest of caterpillars which destroyed the pulse and the wheat was injured by blight. Barley in fact was the only crop which escaped. Large remissions of water-rates were made by Government, but the landlord's rents were, except in a very few cases, exacted as usual.

The water-rate for *rabi* is unquestionably high, and has had an injurious effect both in respect to Government and people in preventing water which is available being put to account.

In suitable localities canal water is used for irrigation even at the cost of considerable labour. Lands bordering the Sempore Distributary are every year irrigated, though the water has to be lifted twice and in places three times, entailing a cost in labour probably equal to the water-rate.

21. The result of the experiments made to date on *rabi* crops is as follows:—

Crops.	Number of experiments.	Canal irrigated crops, average yield per acre.	Number of experiments.	Irrigated from other sources, average yield per acre.
		Mds. srs.		Mds. srs.
Wheat	495	11 1	473	10 31
Barley	57	10 34	58	12 21
Wheat and Barley	117	9 25	108	9 37

Wheat therefore apparently produces as much grain if irrigated by canal water as by the wells usually available, but in the case of barley canal water does not seem to give good results. So far as the experiments go, there is, however, nothing to show that as regards one staple crop canal water might not be much more largely utilised, and probably will be if the rate is made more favourable.

22. That canals in places where there is much percolation render the construction of *cutch* wells in their proximity impossible is a difficulty which is, however, only in parts of the Patna Canal. This difficulty occurs, whilst on the other side owing to the percolation such lands frequently require no irrigation.

23. There is no remedy: the canals, it may be hoped, will gradually become more watertight.

24. The difficulty with the Opium Department was not general: it was most felt in Patna and Gaya and the effect of the *ahara* was most felt in Shahabad. The number of aqueducts applied for—and the application comes through the Opium Department—has not been very considerable, and many of them are little used. The objection entertained to these by Canal authorities had little reference to the irrigation of opium. The *ahara* can be, and, as a matter of fact are, used for irrigation generally; artificial contrivances of one kind or other being

resorted to. There is the temptation, which the late Sub-Deputy Opium Agent of Shahabad had to admit was generally irresistible, of taking the first and sometimes the second watering from the canal, a course leading to disputes the canal officers were anxious to avoid. Experience has proved that the Canal officers were right in considering that there was no general demand for crossings, but it certainly would have been better if they had provided such as were actually required without pressure from another department.

OBSTRUCTION TO DRAINAGE.

54. This matter has throughout received the most careful attention from all the Engineers who have been engaged in the project.

That all drainage works rendered necessary by the canals should be carried out is admitted. On this point there is no difference of opinion, Mr. Odling observing* that—

* Volume I, page 116.

"Any actual obstruction is remediable, and ought to be remedied, provided always that as a matter of fact it exists. Anything like impeded drainage is under all circumstances and under any conditions an evil from an irrigation point of view, as tending to water-log the land. Liberal provision was made on the general estimates for any drainage works that might be found necessary. The fact of drainage being impeded cannot be hidden, though it may happen that it does not at once come to light, the flow in years of ordinary rainfall being absorbed or utilised before it reaches the canal bank."

The fact is, and it cannot be too strongly insisted on, that the Engineer's objection to *aharas*, which is alluded to several times in the Committee's report, is based not on their capabilities as irrigating agencies, but because as a condition of existence they must obstruct drainage. Injurious as the influence of embankments, necessarily aligned across the drainage of the country and, except in rare cases, not provided with escapes must be at present, it would be greatly intensified if canal water was regularly poured into them as suggested in section 282 of the report, and it is for this reason that the Superintending Engineer* advocates caution in dealing with such applications.

* Volume I, page 95.

55. One special case is referred to by the Committee in paragraph 64 of their report. In this instance it is not denied that drainage was interfered with; but, as stated by the Committee, it also—

Volume I, page 24.

"Affords evidence of the action taken by the Engineers to remedy the obstruction which their own works had in the first instance occasioned."

Our sins have certainly found us out. There is, however, no other such case in the whole system. There has equally been no hesitation in remedying the evil appalling to an Engineer as the number of works required to counteract the mistake made has been. One of these only would have been wanted if the correct alignment, i.e., an extension of the Sikrour Distributary, had originally been preferred.

The only condition required precedent to the construction of a syphon is that water shall actually be impounded: wherever this can be shown to be the case, even to a slight degree, there will be no hesitation in providing such a work: where, however, there is no obstruction, no possible good can result from expending public money on the construction of works which, when finished, would be useless.

No trace can be found of most of the petitions for syphons referred to in the report. In a matter of the kind where influential landholders are concerned, it is surely not asking too much if, in cases where their wants are asserted not to be attended to, they are asked to communicate with the Superintending Engineer.

56. In August 1888 the rainfall was exceptionally heavy, and whatever defects in drainage provision existed became apparent. A note by the Superintending Engineer, giving, as suggested by Mr. McNamara,† a list of all cases where the canals or

† Volume II, page 330.

distributaries were breached or cut is attached. The note also contains information as to the drainage works that have been carried out since the date of the Committee's report, and as to what works are known to be still required. A perusal of the note will show that the Committee's recommendation, expressed in the concluding part of section 25 of their report, has received that full attention which it is quite admitted it deserves. Material progress has been made without neglecting the care and caution expressly stated to be necessary, and which has been the real cause of any apparent delay in dealing with the question.

57. Before concluding my notice of this part of the report, it is perhaps desirable to allude to the fact that the drainage works carried out are in many cases of immense benefit to unirrigated tracts of country, it being necessary to deal with the whole area to be drained irrespective of the precise parts thereof affected by the canals. Such a case is the Bachera drainage cut which has cost Rs. 57,763, and which includes a weir by which the water in the *aharas* above can be kept at any desired level. A similar work has just been sanctioned in connection with the Chowra canal.

OBSTRUCTION TO DISTRICT COMMUNICATIONS.

57. The Committee refer to the obstruction to district communications stated to have been occasioned by the canals. The case is thus put by the Magistrate:—

"Existing roads are injured by the side cuttings being used as village channels, by unauthorised channels being made across them, and by flooding from surplus canal water. Potential roads are affected by the canals and distributaries occupying the water sheds wherever practicable."

Of actual injuries stated to be caused to the roads, the road authorities are to a certain extent responsible for the first two, which can only be stopped by criminal prosecutions. Should there be real fear of scarcity, the local pressure is such that they are indisposed to object to any means of irrigation. It has been decided that permanent road crossings will for the future be provided by Government. It is unlikely that any considerable addition will be made to the length of the roads in the district; in fact some roads made in the famine of 1874 have been practically abandoned. The fact that the canals have, as far as practicable, been kept on the ridges, which might possibly in future years have been utilised as roads, is hardly a sufficient reason for the District Board claiming what is *de facto* heavy pecuniary compensation. It is essentially a case of "first come first served."

58. The Committee observe—

"We have seen for ourselves that the canal embankments and towpaths are now largely used as means of communication by the people, and that the convenience of the canals in this respect is appreciated. They are suitable for foot-passengers only, for as a rule the banks and berms are too narrow for wheeled traffic. During the rainy season only it is necessary to impose certain restrictions for the protection of the canals which cannot be relaxed."

To the statement of policy contained in the above extract, the canal officers have never taken exception, but as berms vary in width from 5 to 10 feet only, and would soon be absolutely destroyed by heavy carts, they have been compelled to object to wheeled traffic except in a few cases in which, as a matter of public convenience, the berms of some distributaries or parts of distributaries are kept open during the dry season for light vehicles only, such as *ekkas*. That a very distinct assertion of the right of Government to control the use of the lands acquired and roads formed at its expense is sufficiently obvious from the following resolution of the Shahabad District Board:—

Extract from the Proceedings of a Special Meeting of the Shahabad District Board, held on the 27th of March 1888.

"Read the application of Syed Mohamed Jan and others for a bridge over the Rao Nuddi, and the papers connected therewith."

Resolved that a sum of Rs. 2,000 be provided in the budget estimate for 1888-89 for making a road from Koath village to the Doomsa Canal, and that representations be made to the Irrigation De-

partment to throw open the Doomsa Branch Canal apart from between Tendoni on the one side and a point opposite Karancera on the other, to public traffic as of right."

In this case an arrangement for light traffic was arranged, though the claim to the use of the berms as of right was necessarily repudiated.

The Superintending or some other Engineer connected with the canals would, in the light afforded by the Committee's remarks, probably be a more efficient representative of the District Board than the Irrigation Deputy Collector, who, for some reason not known to me, has been selected apparently to represent the Public Works Department.

DETERIORATION OF PUBLIC HEALTH.

59. The statistics available on this subject are not themselves very reliable, and there is the further difficulty that the divisions into which the resulting figures are abstracted are by no means continuous with the irrigated area.

The actual facts are probably tolerably fairly put in the following extract from the report of the Civil Surgeon dated the 13th January 1880, which was furnished at the request of the Committee:—

Volume II, page 319-25.

"Effect of canal irrigation.—In conclusion, it seems to me that study of such statistics as are forthcoming on this subject that canal irrigation of this district has without doubt intensified existing disease-producing influences."

"It is a mistake to assert, as is sometimes done, that malarial fever was almost unknown previous to the canal period. The fact is that the district has been subject to malarial fevers for a very long number of years, and it is also, I believe, a fact that in some of the 'domic years' the district suffered, certainly to a greater degree, in common with neighbouring districts."

"I fear it cannot be denied that obstructions to drainage have been caused by canals: but numerous other obstructions exist from the canals and embankments, leaving water after heavy rainfall stagnating in barren channels."

"Then it is said that water is wastefully used, and I can readily see its being injuriously used. The cultivation of crops, such as sugarcane, requiring very frequent flushing, has enormously increased since the canals were made. I saw a village a few days ago on the canal, about 20 miles from Dehree, on the side almost hidden by dense jungle and undergrowth, and surrounded so as to be almost invisible by dense crops of sugarcane. Any one with any knowledge of hygiene must know that it is impossible to retain health in such surroundings."

"I think it must be recognised that land surrounding towns and villages must not be irrigated from canals. I need hardly point out how injurious to health damp dwellings are."

"Summary.—To sum up, I should say that the effect of the canal system has been of a mixed nature. On the one hand they have done to have placed the district beyond the danger of famine without do not think this to have been proved, if population goes on keeping pace with production, as before last census, when an increase of nearly one-fourth of a million was found; by offering a means of sowing the crops in years of drought, they have increased production, and made fertile what was previously barren."

"They have without doubt benefited the people by affording means of easy communication throughout the district, and one of the elements of good has been the introduction of a good supply of water to places where formerly it was of very inferior quality."

"On the other hand, they have brought about such conditions without doubt, promote the spread of diseases such as malarial fever, &c. These conditions can to some extent be improved. I have been asked for an expression of opinion as to the remedies which suggest themselves. Much has already been done, I am told, to improve drainage channels, remove obstructions, and to prevent the injurious use of water; more can still be done. But when all has been done that can be done, I fear that conditions favourable to disease will continue to exist in years when the rainfall is above the average."

The extent to which drainage can still be said to be obstructed by canals is shown in the Superintending Engineer's note. Such obstructions never were numerous, but counted for nothing besides the *aharas* which have long existed for generations. The main drainage channel of the district, the river Kuo, was almost obliterated, there being no less than 14 bunds across it when the canals were commenced. Fever has followed—not immediately, many years after—such blocking up of drainage channels.

through Bengal, and it would be no matter of surprise if the usual result was experienced in Shahabad. There were, as noted by Mr. McNamara*

in the extract quoted below, mitigating circumstances which, however, by no means accord with the general statement of the efficiency as irrigating agencies of *aharas* which pervades the Committee's report.

What Mr. Cameron evidently refers to are the numerous *aharas* embanked reservoirs that abound in the district. These have been possibly from prehistoric time—most certainly they were in existence in the days of our earliest surveys of the country. How can these ancient reservoirs have so suddenly produced the new, previously unknown results now attributed to them? It might be answered, because they have been put to new uses. In the old their limits were strictly defined as to area and time. The rain-water that drained into them was limited to the months of the rainy season. As a rule, the supply was too scant for the requirements, in the case of abnormally heavy rainfall, when the surplus water would pass off round the embankments, in the manner provided for purpose, it almost invariably burst the embankment, leaving only a small quantity of water in the reservoir. And the water that subsequently used for irrigation had to be lifted for the purpose. Labour-exerted in the process was tedious. The area under irrigation and the duty of the water were strictly limited. There was no indiscriminate flooding of the country. Long-established custom had created ways and means for the distribution of the water that are remarkable for the smoothness with which they work. Now the irrigation season is indefinitely prolonged. Water is used by the high level canals and distributaries commands every long after the cessation of the rainy season. There is no need of it, and there is not the same inducement to economise it.

The *aharas* are more efficient than before, more and better can be raised, and rice cultivation has to a large extent been financially less profitable *rahi* crops.

It is probable that districts under wet cultivation are years of heavy rainfall less healthy than those in which the crop does not require that for many months the land be covered with from 4 to 6 inches of water. To the health of the district has suffered by this substitution, it may be partially ascribed to the canals which rendered rice cultivation on such a scale possible. On the other hand, as pointed out by the Civil Surgeon above, the have helped to meet an equally pressing danger, the increased population which may even render the increased activity of the soil of no avail. The effect of the season of wet cultivation on the hygienic conditions of the district as opposed to obstruction of drainage, which *de facto* exists apart from the remaining *aharas*, cannot be too strongly insisted on.

The Committee, it is noticed, are of opinion—

that a stronger case is needed than now exists to justify interference by rule with the discretion which the cultivators now exercise in irrigating their lands as they please.

am not prepared to recommend coercion in this respect, as stated by Mr. Mylne, it is unlikely that anything of—

the absolute refusal of canal water would compel the ryots now to the cultivation of that crop.

Water is not now supplied for the purposes of irrigation in Arrah, and there would be no objection to the Sanitary Engineer being vested with power to restrict or direct refusal of permits for irrigation generally, or for irrigation in the *kharif* season only in specified places where proper drainage facilities do not exist, or where flooding to an objectionable extent is persistently carried on, or where the public is apparently suffering.

There is another side to the question, as will be evident from the following quotation from a note, dated the 10th July, by the Hon'ble Mr. Nolan:—

The canals have given what was much wanted in many villages, a supply of pure drinking water, and have so far been of great sanitary value. This must be taken as some set-off against the fact that they are a source of moisture and probably facilitate the spread of malarious

should also not be forgotten that the wave of malarial fever to which reference is made by the Committee, is not confined to irrigated tracts, but is as rife in Bhuboun, where

there are no canals, and on Gya, where the tract irrigated is only a narrow slice along the Sone, as in Shahabad generally and it has now shown itself in Bhagulpore.

VALUE OF THE CANALS TO THE PEOPLE.

62. In the preceding paragraphs the value of the canals to the people has been more than once incidentally referred to, and there probably has never been a more striking instance of the benefits they have conferred than was experienced during the year 1888-89. There was scarcity approaching to a famine in Behar generally, and this is what Mr. Luson, Esq., who was specially deputed to report on the subject, says regarding the crop on the land irrigated by the Sone canals. It "has reached on the average a high standard of excellence, and stands out in high contrast with the sad picture of the almost total failure of the crop which depended upon rain-water alone, or rain-water stored in *aharas* with small local catchment basins."

He observes—

"As soon as I received my instructions, I rode, before the time of *dhau* harvest arrived, through a large number of villages unaffected by the canals. In the cases of small *aharas*, as the great majority are, I found a complete failure of the crop. Very little of it was worth cutting, even for the sake of the straw. In the cases of *aharas* with somewhat larger catchment areas, a few fields only were sufficiently watered (these were chiefly the manik's *zirats* and the higher caste cultivators); and in the cases of some of the very large *aharas*, such as those at Beldhara in Gya, Hitampur in the Jagdispur estate, and Udwantnagar near Arrah, the area commanded by the *aharas* was all watered and produced a good crop, though more water would have improved it. But such large *aharas* as these latter can be counted upon the hand. The *dhau* crop dependent upon *aharas* this year, as far as I saw it, was a great failure. It was upon the whole much under 4 annas—probably about 2 annas—of the crop on canal-irrigated lands.

63. The value of the rice and wheat crops on the area irrigated by the Sone canals in 1888-89 alone exceeded 76½ lakhs of rupees, and it is not too much to say that half at least of this sum would have been lost to the people but for the canals. In the sum mentioned above no account is taken of other crops, such as sugarcane and barley of the value of 33½ lakhs of rupees, which benefited materially by canal irrigation. The total amount leviable as water-rates on crops of the value of 110 lakhs of rupees was 8 lakhs only, or about 7½ per cent. on the value of the crops irrigated.

PART III—COMPLAINTS AGAINST ADMINISTRATIVE PROCEDURE.

64. The Committee commences by acknowledging that improvement has been effected in both the assessment and collection departments during the past two years. They say:

"The improvement is admitted by several of the witnesses who gave evidence before us, and as a fact we find that the great majority of the individual complaints we have received relate to the events of past years."

It is in fact only necessary to refer to the complaints in which names are mentioned, when it will be found that reference is frequently made to events which occurred eight or nine years ago, into the merits of which any kind of investigation was impracticable. The improvement mentioned has since been more than maintained.

COMPLAINTS AGAINST THE ENGINEERING STAFF.

65. Under this head both "Assessment and blackmail," and "Unauthorized irrigation," separately noticed in the Committee's report, will be considered.

It has been explained (paragraphs 17 to 21 of this Note) that in the earlier years of irrigation in Behar an attempt was made to follow, as far as practicable, the system pursued in the North-West Provinces, that is, to depend on the patrol's register or *shudkar* as the basis of the demand statement. The introduction of five-year leases was the first decided attempt to dispense with the services of subordinates of this class in the assessment of irrigated land. The area under five-year lease for the last three years has averaged 240,000 acres,

out of an average of 313,000 acres irrigated yearly, so that approximately two-thirds of the area irrigated has been altogether withdrawn from the cognizance of the patrol for some years past. As will be explained later on, the procedure in the case of annual *khari* leases has, to a large extent, been assimilated to that followed for five-year leases, and irrigation beyond the boundaries specified in the application has ceased to be assessed, so that the patrol's functions have been much restricted; in fact, so far as the assessment of *khari* crops, his influence, which was always more restricted than would be inferred from the report, has altogether disappeared.

66. The complaints, to a certain extent endorsed by the Committee, have been that unirrigated lands have been assessed, that blackmail has been levied, and that the law and rules have been oppressively interpreted to the detriment of the people of the country. On the other hand, there is the conviction of the Engineer referred to by the Committee in paragraph 157—

"that Government is more ill-used by the cultivators than the cultivators by Government, and that instead of the cultivators being themselves oppressed they are rather the persistent trespassers and offenders upon the patience of a long suffering department."

The opinion given is quoted by the Committee as evincing a want of sympathy with the people, though (paragraph 180) it is not denied that—

"In some villages, especially Brahmin and Rajpoot villages, there is an everlasting struggle carried on to get water without paying for it."

It must be obvious to any one reading the report that a large number of the witnesses more or less resent having to pay anything more than a nominal amount for so common a commodity as water. As observed by Mr. Power,* the great majority of the witnesses before the Committee were Rajpoots and Brahmins—

* Caste who always claim special privileges and resent being placed on an equal footing with working cultivators."

With regard to the assessment of unirrigated lands, the same officer observes that—

"Nearly all appeals have reference to unauthorised irrigation. When there is proper evidence in support of the assessment, it must of course be upheld. My conviction in such cases is that in most such cases the canal underlings have been bribed to wink at the malpractice, and that the Canal Sub-divisional Officer's vigilance alone has defeated the fraud; they come chiefly from the Bhojpur pergunnah."

The Canal officers were quite aware that efforts would be made to bribe these subordinates, and doubtless, as stated by Mr. Power, exception was taken when the unauthorised irrigation was detected and the people had to pay twice over, especially where an unsuccessful appeal was preferred.

67. The evidence on the subject of blackmail labours under two disadvantages: first, that it mostly consists of statements which were in no way sifted; and secondly, the bribe was frequently avowedly given with the object of obtaining some illegal object. That the statements made are far too sweeping is obvious from the appendices to the report: for instance in section 105 a pleader's evidence is cited as to the corruptness of the overseer, which was expressly denied by witness No. 74, who is believed to be his own servant. Other witnesses, Nos. 86 and 90 may be taken as examples, refer to the incorruptibility of a particular sub-overseer. Another pleader (section 122 of the report) was equally mistaken, the village mentioned having been irrigated, in the first instance without permit, in the very next year.

The subordinate staff employed on the canals are probably neither better nor worse than those employed in other departments: whatever power they originally possessed has been, as already pointed out, largely reduced, and it is evident from Mr. Power's remarks quoted above that the bribes

when given were, owing to the close supervision exercised, little real use.

68. Replies more or less conclusive to the allegations regarding assessments and unauthorised irrigation were found in the reports of the Canal officers quoted in paragraph 8 of this Note; and as the remedy taken is of a nature

altogether exclude the possibility of the recurrence of such cases, it is probably sufficient to allude briefly to the three brought forward by Mr. Mylne and commented on in sections 117, 118, and 119 of the report.

In the case of the village Keshwa the Collector means admits the justice of the Committee's remarks. He points out that the assessors were in a position to know the proper procedure

there was no apparent reason why they should deliberate the period of appeal to lapse and then seek a re-consideration of the question. The Assistant Engineer concerned observed

that at Ramnugger, between the 24th September and the 20th October, the only rainfall was one-tenth of an inch on the 10th October, and that water was certainly required. The Collector with all the facts before him, declined to interfere, and it scarcely be fairly contended that the case was not considered by an independent tribunal.

In the case of Banwar no appeal to the Collector was apparently made, the assessors accepting the Engineer's order modifying the amount originally charged.

In the case of Chukwa, the Assistant Engineer points out that in the two years succeeding 1844-45 land was admitted irrigated, and that his assertion is not that water escaped from five-year leased lands into the village, but that the water about four channels was entirely diverted into the village. Under any circumstances, and whoever might be the applicant officer, the Sub-divisional Officer had an undoubted right to prepare a demand statement, and it was for forcibly removing a Government officer in the execution of his duty that a prosecution was instituted. Different defendants were tried by three different Magistrates, with the result, upheld on appeal by the Judge, that convictions were in every case obtained. In fact, three independent tribunals took a different view of the case from that which commends itself to the Committee.

Different as is the aspect which these cases present from different points of view, there can be no question that neither in the interest of the people nor of the Canal authorities that such disputes should arise: there is the further fact admitted in paragraph 21 of this Note, that the Canal officers were also to blame in permitting a supply of water through the outlets in excess of the requirements of leased areas: the actual remedy taken has been to impose conditions which practically forbid unauthorised irrigation in the *khari* lands being assessed at all.

69. The instructions quoted at length below were issued by the Superintending Engineer with my concurrence, in consideration of the most prominent defects noticed in the Committee's report. The Circular refers to other instructions beyond the one under discussion which will be referred to on another occasion requires:—

Circular No. 1, dated Arrah, the 31st March 1888.

TO DIVISIONAL ENGINEERS.

The proceedings of the Irrigation Committee having shown that in some cases an alteration in practice is desirable and that the rules are not strictly adhered to, I have the honour to request that particular attention may be given to the following instructions:—

I. *Complaints*—A separate receipt must be given for each complaint, those belonging to one village or for the same person must not be lumped together in one receipt. One day is to be fixed by the Sub-divisional Officer for receiving complaints and it is expected that he will be present on that day to receive them unless unavoidably prevented, in which case the villager

authorized to receive petitions. The Sub-divisional Officer must also receive petitions on any other day on which they are tendered, if sent at head-quarters. Executive Engineers must make arrangements to receive complaints daily, and petitions sent through the Executive Engineers are not to be refused on that account.

Village channels.—Great complaint was made that five-year leases were granted where no proper arrangements for the supply of water existed. In future no permit is to be issued until proper and permanent village channels have been provided. No exception in this respect is to be made owing to money being deposited for a permit to be made by Government agency.

Lands on bhaoli tenure.—In the case of lands held on bhaoli tenure, the zemindar's signature is to be obtained before that of the Executive Engineer, and if it is refused, the ryots are to be informed in writing that a five-year lease will not be granted. Every such case is to be reported to this office.

Five-year leases.—No preliminary application for five-year lease is to be received after the 1st of July; and in cases where, after the 1st of July, the signatures of all the ryots cannot be obtained, the orders of the Executive Engineer are to be taken as to whether the lease should not be definitely refused. All applications for five-year lease must be accompanied by an application at annual rate, if water is required to be given before the five-year lease permit is issued. The number and size of the outlets will be specified in the permit issued for a five-year lease, and no reduction in their number or size made during its currency.

Unauthorized irrigation.—The provisions of sections 78, 79, 80 of Act III (B.C.) of 1876 are to be strictly observed. No unauthorized irrigation is to be assessed without the written order of the Executive Engineer, and in passing this order it must be explained—

—That the person by whose act or neglect the irrigation occurred can be identified, and

—That benefit has been derived. Where unauthorized irrigation has occurred through the negligence or with the connivance of the servant, no assessment can be made. Irrigation from aharas, which may have been filled or partly filled with canal water, is not assessed. The aim of Canal officers must be to prevent unauthorized irrigation rather than to detect and assess it when it occurs.

Outlets.—In the definition of village channel the outlet is only excluded. It follows that the Canal officer is responsible for the opening and closing of the outlet, and unauthorized irrigation through the outlet not being properly looked after cannot be assessed. In the case of permanent outlets permits should be issued where unauthorized irrigation is likely to occur, and in the case of temporary outlets their size should be adjusted to the area irrigated for.

Shudkars.—The signature of the zamindar should be obtained when land is for the first time entered in the shudkar, and the shudkar should make all entries in his register in the presence of the ryots, or, where his attendance cannot be procured, in the presence of two or three leading villagers whose names should be noted. The shudkar should be frequently examined by the Sub-divisional Officer, the sildar, and the sectional officer, and orders recorded thereon.

It will be noticed that paragraph V clearly lays down the principle that prevention, not punishment, should be aimed at, and paragraph VI affirms the responsibility of the Canal Officer for the proper regulation of the supply through the outlet.

One result of the orders given was that in 1888-89, 1,456 acres were leased whilst 69,621 acres only were assessed at the annual rate. It is clear that written applications had been filed where the annual rates were levied. These areas are those assessed at the annual rate. There may be more criminal prosecutions for unauthorized irrigation as recommended in paragraph 304 of the Committee's report; but, so far as unauthorized irrigation is concerned, it is proposed that in future, before water-rates are assessed, section 79 are imposed for *khurif* irrigation, the charge to be approved of by the Collector. In such cases more ordinary rates should usually be imposed.

THE FIVE-YEAR LEASE SYSTEM.

The deliberate opinion of the Committee may be said to be summed up in paragraphs 143, 144, which are quoted as follows:

"It is tedious to enter into such details; but it is necessary, in order to justify our assertion, that some portion at least of the popularity of five-year leases is due to other causes than the popularity of the system."

"We are able to fully recognise the comparative advantages enjoyed by the holders of five-year leases. These advantages are appreciated by cultivators who possess no other sources of irrigation than those which the canal supplies. Among these

the five-year lease system has extended by a healthy and natural process. But to the lands of others, who are not dependent on the canals for irrigation, the five-year lease system has been extended by other means. The procedure followed has been marked by constant pressure."

The individual cases quoted by the Committee will be commented on presently. In the meantime the following facts afford perhaps the most conclusive evidence that the Committee were in error in concluding (paragraph 135) that the area under five-year lease

was due to any other cause than the increasing favour with which the system was regarded by the people. The Superintendent Engineer was, in Bengal Government order No. 1921, of date the 8th February 1888, vested with power to cancel five-year leases. No single application has been refused. There leases, aggregating 1,456 acres, were cancelled in 1888-89, and five leases, aggregating 529 acres, in 1889-90. The area under five-year lease in 1888-89 was 200,102 acres against 210,535 acres in 1887-88, but applications for 15,050 acres were refused or not completed owing to the more stringent conditions as to channels and suitability of block insisted on. This year, 1889-90, the area under five-year lease will show a further increase. In fact, since the Committee sat, five-year leases for 65,500 acres have been concluded, and except where the Canal officers have raised objections, nearly every lease which has lapsed has been renewed. It is not denied that formerly assessments in cases of unauthorized irrigation, a species of pressure not necessarily improperly applied, had some effect in inducing the cultivators to make a regular application for a five-year lease.

72. Turning to the instances quoted. Nonhur is selected by the Committee as a very special case showing the pressure exercised by Canal officers. The case appears in a very different light the Hon'ble Mr. Nolan, whose remarks, dated the 10th July 1889, are quoted below:—

"The only investigated case on which Mr. Cotton and Baboo Jai Perkaish Lall rely to establish the fact that coercion has been exercised of a nature to justify the general reduction of rates is that of the Nonhur villagers, described in paragraph 140 of the report. 'Could anything,' they ask, 'show more conclusively than the circumstances of this case the extraordinary pressure which is being put on the people to induce them to take five-year leases?' 'We can imagine,' they add, 'no clearer case than this, to use Mr. Solano's words, of "forcing five-year leases down the throats of the people." The sole witness examined in support of this case, Bisheshwar Roy, No. 60, opens his statement by saying: "There are no means by which our village can be irrigated; there is no channel." With reference to this, we must consider the Committee's observations:—"It is true that the village is situated by the side of the Bhojapore distributary, and that it is bounded north and south by villages which are already under five-year lease." Now if the village lies actually on the side of a distributary, and not, like many less fortunately situated, some miles off, what are we to think of the witness who says there are no means of irrigation? He goes on to depose that he had never heard of any man of his village having applied for a five-year lease, whereas it was ascertained from other sources that no less than three such applications had been made, one for 400 bigahs, in the previous month. In addition to this oral statement, there is the documentary evidence of a petition presented to the Engineer in charge, which contains the words described in the report as "pathetic"—"we accept the five-year lease to avoid your annoyance." The annoyance consisted in charging cultivators for surreptitious irrigation charges against which they could appeal, if so advised, to the District Collector. And their subsequent conduct proved that an overwhelming majority of the ryots, a majority to whom the Committee would give the power of binding the minority, really wanted the lease, as is shown by the following statement of Mr. Odling:—

The applicants have since had ample time to reconsider their position. Any influence which Canal officers might have possessed has, for the time being at least, disappeared, and the result is that since the sittings of the Commission at Dhungain, a formal application, signed by the holders of the 420 out of 450 bigahs comprised in the block, has been signed, and will be submitted to me for sanction under rule 10, page 239, Irrigation Manual. The holders of the 30 bigahs who have declined to sign were probably the only real opponents of the lease, and able to a certain length to carry their co-villagers with them.

"Many persons will, perhaps, be inclined, under the circumstances, to answer by a distinct affirmative the question of the members of the Committee—Could anything show more conclusively than this

case the extraordinary pressure which is being put upon the people to induce them to take five-year leases? And if after a protracted enquiry this was the best evidence which the Committee found; if, with all the results of their investigating before them, they could not, as they say, even imagine a clearer case, what must we consider to be the character of the evidence in support of other allegations of coercion?"

Mr. Mylne does not give the facts on which he considers pressure was put upon the village of Chukwa, but it is clear from his letter of the 18th August 1886* that a majority at least of the cultivators of Jugdispore desired a lease, the difficulty not being with his tenants, but with rent-free holders. The lease has since been renewed.

As regards the other cases, it is clear that the real object of the Canal officers was to prevent unauthorised irrigation, i.e., to prevent a valuable commodity, the property of the public, being used without payment. Whether the lease was annual or five-year was not a matter of concern. What was aimed at was the assessment in some regular way of land the crop on which was benefited by canal water, and the cessation of irrigation without application or permit. The mistake made, which has been fully acknowledged, was the facilities given for unauthorised irrigation by permitting the cultivators to allow a supply of water to flow through the outlets in excess of the legitimate demand for leased areas. This error was being gradually corrected, and during the last two years the Canal officers have, as they are legally bound to do, themselves taken charge of the supply of water through the outlets.

COMPLAINT OF DEFICIENCY AND IRREGULARITY OF WATER-SUPPLY.

73. This complaint is admitted to be now practically non-existent. It has disappeared with unauthorised irrigation. The Engineers have adjusted the outlets to the areas to be irrigated, and have temporarily stopped the supply when it was found that water was being used beyond the leased areas: in some cases they have instituted criminal prosecutions. There are still difficulties with regard to individual holdings when there are village quarrels, or where the more powerful men are disposed to oppress their weaker brethren. The absence of complaint on this head in the Jugdispore estate was in truth more due to the care and trouble taken by Messrs. Burrows, Thomson, and Mylne to see that the supply of water was fairly distributed and economically used than to any special consideration in the matter of supply shown to them. It has at times taxed even their energies to secure a fair division of a supply of water which, properly and economically used, was ample. Unfortunately there are many non-resident proprietors and—resident or not—no others who have an establishment competent and willing to carry out distribution arrangements so effectively as the firm named.

74. The Canal officers can secure a proper supply of water to leases (blocks), but ordinarily the internal distribution must be managed by the lessees: at times a subordinate has been deputed to insist in the water not being monopolised by one section of the cultivators; but as regards particular holdings there will always, in the absence of influential and fair-dealing *lambardars*, be a chance of individuals suffering. So long as *lambardars* are remunerated their responsibilities in this respect can be enforced, and default can be in most cases be punished, though inadequately.

75. There remains the important question whether the supply allowed should be calculated on a total absence of rain, such as occurred in 1888, or whether a low average, say half to three quarters of an inch in the first ten days of October, should be reckoned on. In the proposals which will be made later on, the experiences of 1888 will be for the most part relied on; but the avowed object will be that in such years

which are not of frequent occurrence (though those which there is a scanty rainfall are) there shall be no difficulty in obtaining a full supply. The quantity of water supplied will suffice, but there will not be the ordinary margin for waste, which, indeed, is then less likely to be permitted to occur.

76. In the earlier days of irrigation, before the results of past experience were available, permits were issued in the *kharij* season for irrigation in villages which it is now known cannot be satisfactorily supplied in a season of pressure. The Canal officers were unable, until they had experience to guide them, to determine with any approach to accuracy the irrigating power of the canals, especially with indifferent channels and a system of cultivation which was itself in process of yearly change. There were therefore grounds for complaint—unavoidable under the circumstances mentioned above.

77. It will be noticed that the Committee* expressly states that the power vested in Canal officers of stopping the water-supply has rarely exercised, and that in one case only, where redress was promptly given, was there any ground for complaint.

SYSTEM OF ENQUIRY INTO COMPLAINTS.

78. As stated by Mr. Power—

"The great desideratum is to have a large proportion of objections disposed of in the quickest time possible by officers of an average high class."

The nature of the complaint made is now analysed in great detail in the Superintendent Engineer's Revenue Report. Every complaint made, though it may in point of fact be identical with one previously or simultaneously preferred, is separately numbered so that the information contained at page 18 and Appendix XIV of his report for 1888-89 may be looked on for practical purposes as complete. The whole proceedings in the case of twenty consecutive complaints from the last division inspected by the Superintendent Engineer have been examined. In effect they are little more than requests for alterations, and eventually the decision arrived at is more or less acquiesced in by the person making the complaint. Some 200,000 different charges to be made yearly are certain to be mistakes, and it appears to follow almost as a necessary corollary that the officer charged with the assessment should also have the power of correcting it. In the words of Mr. Inglis—

"As regards the second point, the Canal officer who makes the assessment is primarily in the position as any other merchant trader who submits his account for goods supplied or for work performed. It appears to me only a matter of ordinary reason that any complaint as regards a charge in the bill should be made in the first instance to the person who prepared the account. It is true that the enquiry by the Canal officer into the assessment made by him is termed a 'judicial proceeding,' but I do not see how this affects the question. What is desirable is that mistakes in the assessment should be put right as soon as possible, and this can, in my opinion, be done sooner by the person who made the mistake than by one else. The Canal officer is no doubt in a different position from that of a private trader when the question of enforcing payment of a disputed item in the account is considered. The law that prevents that in case of debts due to Government payment can be enforced without recourse to the civil courts applies to 'water-rates' as it does to other demands, such as rent of land, cesses on land, &c. But the decision of the Canal officer is not final. There is a right of appeal to the Collector, who is certainly not a prejudiced officer, under the present system of assessment."

There have as a matter of fact been comparatively more complaints in Orissa and nearly as many in Midnapore, where the assessments are not made by Engineers and the percentage admitted is even higher. The grievance is most strongly insisted on "unauthorised irrigation" proposed to deal with in another and more drastic manner, and an alteration in the agreements regarding the supply of water in the hot weather which furnish the majority of complaints regarding insufficient supply will be made, so that little except ordinary mistakes will have to be dealt with by the assessing officers under this. In 1888-89 upwards of 2,000 complaints were at once disposed of in favour of the applicant, and it is clear that any system which would have entailed a reference to another authority would have caused needless expense and trouble to persons concerned.

What is wanted is that the assessing officer shall be apprised of the objections raised, and have an opportunity of rectifying an error, if one has been made: after that it is in the interest of both Government and the cultivator that an accessible appeal to an independent tribunal shall be available.

It is proposed to secure this end by allowing appeals from the orders of sub-canal officers to the Collector or Deputy Collector specially vested with the powers of a collector in this respect. This is apparently the course recommended by Mr. E. Solano in the following extract from his letter dated the 31st December 1887:—

I.—Sub-divisional Officer to prepare *khationis* in the usual manner, notices to be given to each assami, stating the quantity of land assessed against him and the amount of demand.

II.—All appeals to be presented and disposed of by the Sub-divisional Officers. If the objection is rejected, he is to give the assami a copy of this order.

IV.—The appeal from the Sub-divisional Officer's decision to be made to the Collector.

This is the system proposed to be followed in future. Solano lays much stress on the number of Sub-divisional Officers being increased. As a matter of fact there are nine divisions as recommended by him, of which the two in the Buxar Division are not by any means the largest. The result of the appeals so far made to the Collector is the statement below will show, not been unfavourable to Canal officers, and in cases requiring it further action is called for and taken, should the record not be otherwise satisfactory:—

Statement showing the result of appeals preferred to Collectors against orders of Canal Officers of the Bona Circle.

Year.	Number of appeals.	Appeals allowed.	Appeals dismissed.	Pending.
1887-88	143	61	76	17
1888-89	73	5	68	0
1889-90	61	13	48	0
1890-91	23	3	20	0
Total	299	79	192	17

The Collector of Shahabad's letter No. 9491, of the 31st August 1889, it is stated that complaints had been disposed of by him and his predecessors between 1879-80 and 1888-89, of which 121 were dismissed, 29 allowed wholly and 11 allowed in part.

Mr. Luson, who investigated the subject, recommended a classification of complaints which has practically been adopted. He was of opinion that the true method of dealing with the subject was to anticipate objections, or rather to have them being preferred before the demand statement was finally prepared. This is what he says on the subject:— "I wish here to suggest a practicable means of discovering as far as possible the areas in which there has been a failure of the

crop owing to deficient supply. The Superintending Engineer has given his general approval of it. It is to insist upon a report by a certain date from each *sattadar* of the specific fields in which the crops fall below a certain standard, say that the outturn will be below 2 maunds a bigha. In the case of *dhau* these reports should be brought or sent into the canal office before November 1st; and if any *sattadar* neglects to send the report in time, he should be at once called upon to explain personally. The *sattadar* is overpaid for the work he does at present, and there seems no reason why this extra duty should not be imposed.

On receipt of the reports, the Sub-divisional Officer would be able to mark down the bad crops and to make arrangements for investigating the causes before the cutting; but in many cases he has a very good idea of where the supply was deficient, so that he could direct the measurements in these places first and commence enquiries before these reports come in."

In the part of this note dealing with the alterations recommended it will be proposed that *lanbardars* shall be bound to report at the end of the *khari* season, the 1st of November, what complaints require investigation, and a separate report will be required from sectional officers on the 15th October or thereabouts as to the state of the crop in each lease. These measures, it is thought, will ensure the Sub-divisional Officer being in a position to omit from demand statements or to include in remission statements any areas on which water-rates are not properly chargeable. The onus of ascertaining what remissions should be granted will in fact, to a limited extent, be assumed by Canal officers, with or without complaints.

It is hoped that the means taken will ensure speedy redress in cases where there are just grounds for complaint.

82. The exercise of magisterial powers by certain of the Canal officers is noticed in the concluding sections of this part of the report. The Committee remark:—

"We are glad to notice the very sparing manner in which these powers are now exercised, and we have no reason to doubt that, as a general rule, they have been exercised in the past with discretion. We are aware that the withdrawal of the powers will weaken the hands of the Engineer officers at times of crisis."

They add that in the Buxar Division the powers were not then exercised, and that as it was objectionable on principle that Engineers should exercise powers in departmental cases, they recommended that the powers should be withdrawn.

In the following year practically every Magistrate and every available constable in Shahabad was engaged in guarding the canals and distributaries, despite which they were cut in several places, and the leased areas of some villages injured and in some cases destroyed by their supply of water being cut off. One special case is mentioned in which the rice on 512 acres, worth approximately Rs. 16,000, was injured in this way. In the face of these circumstances it would appear to be preferable to leave matters as they are, the control of the Magistrate of the district, to whom every case is appealable, being sufficient to ensure that the powers are exercised with discretion. This is the opinion held by Mr. Power.

It is desirable that Assistant Engineers should, as in other provinces, be called on to pass an examination in elementary law, and one of my recommendations will be to this effect. The examination will have reference to their work both as assessing officers and to the class of cases they are authorised to try when vested with magisterial powers.

COMPLAINTS AGAINST THE COLLECTION DEPARTMENT.

83. The Committee remark that the complaints against the Collection Department arose to a considerable extent from demand statements, in which it was known that alterations would have to be made, having been forwarded to the Collector for realization. Pressure was brought on the Assessing

Department to forward the demand statements by fixed dates with the result mentioned above. They are :—

	Rs.
1887-88	87,344
1888-89	34,640
1889-90	18,313
1890-91	16,234

Includes remissions disposed of by refunds or cancelled demand statements.

"We are glad to say that this matter, as soon as it attracted attention, was enquired into and stopped."

The progressive diminution in the remissions yearly allowed, which are marginally noted, will show that a marked improvement in the accuracy of the demand statements has ensued.

84. The realization of arrears of water-rates by the distraint procedure is referred to in section 173 of the Committee's report.

As the water-rate is a charge inferior to rent only on the crop, this method of recovery of which the legality is unquestioned appears *prima facie* to have much to recommend it. The real grievance consisted in the costs, which it is stated averaged Rs. 8-12-10 per case, the average demand being under Rs. 3. The costs amounted to an enormous addition to a charge, however moderate, in itself.

The practice for reasons not clearly apparent, but probably owing to the heavy costs entailed, which are referred to in the following remarks recorded by one of the Hon'ble Judges of the Calcutta High Court has of late years been abandoned :—

"A continuance of the present practice must ruin the ryots. No doubt water-rates should be promptly paid, but it is not always that a ryot has cash in hand to meet such demands, however honest he may be. To make him pay tenfold is certainly not calculated to improve his position. I heard while at Arrah that a somewhat serious attack had been made upon the person of an irrigation officer. It is not improbable that these distraints may have provoked such conduct."

Apart from the question of costs, there does not appear to be any good grounds for abandoning what appears to be a peculiarly legitimate charge on the crop which was matured by the aid of canal water, and the law should, I think, not be changed in this respect unless some summary powers are given by law, as recommended by the Deputy Collector, for the recovery of sums under Rs. 10 in amount.

85. The Committee make the following remarks on what is known as the joint and several liability system :—

"The complaint which has been urged before us most frequently relates to the provision in five-year leases under which all the co-signatories of the lease are made jointly and severally liable for the payment of the whole of the amount due under the lease. This provision applies to leases in what is known as form C. In D form leases, under which collections are made by a contractor, there is no such provision. The object of rendering all co-sharers jointly and severally liable was apparently to instil into the minds of all a sense of joint responsibility under which the influence of all would be brought to bear upon each individual to pay up the amount which might be due from him singly. And this object is no doubt one of importance. The principle is calculated to work well in some cases. But it is obviously liable to abuse; and so we find that in its widespread operation in the case of water-rate leases, it has been applied as an engine of injustice."

Instances of oppression are adduced, and it is stated that the system is opposed by the Engineers who have found from experience that it deters cultivators from entering into five-year leases.

The soundness of the Committee's conclusions as to the oppression exercised is strongly questioned both by the Collector and Deputy Collector. An extract from the observations made by the former, Mr. Power, is appended :—

"Paragraphs 174 to 176.—I beg emphatically to protest against the conclusions arrived at in these paragraphs. Out of Rs. 3,44,945, to which the joint and several liability clause applied, a sum of Rs. 1,460 only was recovered from persons in excess of their proportionate share. In 1887-88 none of the demand was so realized; consequently the percentage recovered in excess is very small indeed. There is no reasonable ground for the imputations that the power has been used as an engine of injustice and to save the collecting staff trouble. It is true that in a few, a very few, cases the liability has been enforced, but under what circumstances? After each assessor had paid his individual share, a balance remained unrealized,

the contracting body was known to be well able to pay, and it happened that defaulters were reasonably believed to be men of whose names were included in the lease by connivance of the less signatories in order that a remission might be granted on the ground of their poverty. Is it not right that when a certificate has been put out against the whole body, execution should be taken first against the leaders, that is, the zemindars, thikadars and headmen? take out execution simultaneously against each co-signatory, and proportionate share of the unrecovered balance, however equitable theory, is totally impossible in practice. There is an excellent illustration to the Committee's remarks on Debi Mahtow's case. It was enough for Debi Mahtow, thikadar of the village, to make him pay what the Irrigation Department thikadar failed to collect. The thikadar pays occasional visits only. Anyone who finds it inconvenient to meet him can easily find it convenient to visit him at some distance until he has moved on. A resident thikadar, however, knows exactly when a ryot is in a position to pay, when he has received his poppy advances, when he sold his linseed to the itinerant bepari, and what the hoifer he has at the fair fetched. Once a thikadar is out of the village he is with temporarily at least; but the thikadar is always with him, need say no more to show that a resident zemindar or thikadar means of applying for payment at the right time not open to a thikadar, and more direct power of enforcing payment than is possible for the collecting staff of the Irrigation Department to exercise. The Special Deputy Collector's explanation on this subject expressed in rather forcible language, but I think his indignation by any means unjustifiable."

86. The Deputy Collector is even more emphatic in his Letter, dated 26th May 1888, paragraphs 9 to 13, the Committee that—

"Nowhere in Bengal has the law been more inconsiderately administered with larger and more obvious opportunities of abuse than in Shahabad."

He points out that in the two years, 1885-86, 1886-87, during which he applied the rule, Rs. 1,460 only was recovered from other than real debtors, and avers that the cases bestowed by the Committee in individual cases were warranted by the circumstances which were not fully known to them. The Committee state—

"We do not condemn the system absolutely; the power (that) implied may conveniently be held in reserve for extreme cases, to be exercised with great caution; but when the opportunities for its misuse are abundant as they now are in the collection of water-rates, we do not think that the exercise of the power can be justified, or that it will be possible to impose any system of check which will prove effective."

87. It appears to be doubtful whether the condemnation pronounced by the Committee on both the system and its results was not too sweeping. It is, however, hardly worth while to retain a rule, which has some influence in deterring cultivators from joining in applications for water for the sake of small amounts recovered under its operation. These amounts would be further reduced if, as certainly would have to be the case in future, had debts were recovered *pro rata* only from the signatories of the lease.

88. At present amounts due on five-year leases are recovered by instalments, and the Committee, while entirely approving of the principle on which the present system of collection is based, viz—

"That a receipt shall be given for a fixed and known amount specified in it," think that "the effort is somewhat hard on the rate-payer; and while maintaining the rules substantially in integrity, we consider that they should be adapted to the present two instalments of the rate every year in equal parts instead of one."

The Collector and Special Deputy Collector both express at most repugnance to this proposal. They point out that it will necessitate increased establishment, and the latter objects that on the whole of the 238 petitions, of which abstracts have been given in the report, he has only been able to find one man who has applied for the change. Seeing that water-rate on two-thirds of the irrigation is now paid in two instalments it is probable that the extra work would be less formidable than is supposed, but as it is proposed to lower the rates for *irabi* irrigation, and not to encourage annual leases for *irabi* irrigation, no farther alteration appears to be required. Mr. L. Mylne observes :—

A great deal may be said against recovering rates in two instalments, and much in favour of payment in one instalment about harvest time, when the cultivator is in funds and can command cash."

Certificate procedure.—The Committee (paragraph 266) state that, whilst there are no actual proofs of the fact,

have no doubt that the same processes have been resorted to for the recovery of arrears of water-rates in Shahabad as are invariably adopted in other parts of India, and in other departments large collections have to be made by the collecting authorities from an almost infinite number of cultivators."

they, however, admit that—

It is possible to establish a strong case on the other side. In villages, especially Brahmin and Rajput villages, there is an unending struggle carried on by the cultivators to get water without paying for it."

As proposed in paragraph 266 of the Report to take away from the Special Deputy Collector his powers under the Certificate Act. The Collector strongly objects to this suggestion, as will be seen from the extract quoted below:—

As pointed out by the Special Deputy Collector in his note, there is nothing illegal or unauthorised in the present procedure, and I am strongly opposed to any change. From experience gained in the Road Cess Department, I am certain that not only would there be great delay in issuing of the certificates, but ultimately the assessors would be dissatisfied. Supposing the change were introduced, what would happen?

The certificates would be referred to the Deputy Collector in charge, who has already upwards of 2,000 on his file more than he can deal with effectively; when, after much inevitable correspondence, sanction had been accorded to an increased establishment, the notices would be written up and made over to the collector's office; that officer is fearfully overworked as it is—see Report of Salaries Commission, pages 261-264. So what happens? The delay occurs in serving them; then (after the defaulter has given a warning that he had better conceal it) commences the process of attaching the property to which the defaulter has not the smallest interest in making adequate provision. The defaulter is only too ready to pay a consideration for the report of "no offence." Then ensues a complication about recovery of process fees. Altogether, I cannot conceive any proposal more likely to increase work, retard collections, involve loss of revenue, and cause harassment to defaulters than to transfer the issue of certificates to the Collectorate General Department."

The proposal has no special connection with the other alterations proposed on the system of irrigation administration under discussion, and it involves considerations not touched in the report. It is therefore reserved for separate treatment after the other changes proposed to be made have been decided upon.

It may be mentioned that in Orissa and Midnapore the provisions under the Certificate Act are not altogether satisfactory. The matter is obviously one in which the opinion* of the Board of Revenue is entitled to almost paramount consideration.

The enforcement of the payment of even just dues can be a pleasant proceeding for the payees. It is certain that any faltering in pressing collections can only lead to accumulations of arrears, a part of which will never be paid off, and thus lead to loss to the public treasury. The Collector will eventually have to be recovered by the means of attachment. It was felt in the first instance in employing the Deputy Collector gives the following as the result of his experience in the matter:—

"I tried the experiment of keeping separate registers of the names of the biggest and the most intelligent zamindars of the district, and addressing them by letters to pay up, but without effect. In one exceptional case, viz., that of the Behera firm, it must be their credit, I have been successful. The biggest zamindar in the district, viz., the Maharajah of Dooarraon, I regret to have to say, has given us no inconsiderable amount of trouble. Letter after letter and reminder after reminder sent to the Dewan calling for rates due, but still the money is not forthcoming, and even when it is sent in rare instances, is not vouchsafed. A letter from the Collector of the district is not sufficient to induce the

Raj to pay up the full amount due from it. During the past three years, I was obliged, in a large number of cases, not only to file certificates and issue notices of demand against the Maharajah, but also to issue warrants of attachment. Similarly, the rates due by Baboo Baij Nath Sahai, a big zamindar and mahajan of the town, is never paid without coercive measures. It is a noteworthy fact that he always waits for a notice of demand, inasmuch as it gives him a month's time after the notice is served, and which he considers a great advantage. I can multiply such instances, but it is hardly necessary for me to do so here. Suffice it to say that when such is the conduct of the biggest and richest men of the district, what can be expected of the less favoured."

With such examples it is scarcely possible not to recognise the truth of the observations with which Mr. Power concludes his notice of this matter:—

"I would ask whether, in the face of the difficulties specified, any display of weakness, however amiable, would not result in loss of public revenue; in other words, in making less refractory people pay an undue share of general taxation? It is charged against our collection department that the aim of its policy is

Letter No. 2401 of the 31st August 1888. *Debellare superbos* (see written statement of Laluram Puro, ex-Sub-Inspector of Police, Appendix IV, Part IV, section 13, page 212, Volume II).

The allegation appears to me to involve an unconscious compliment. If the poor only had been rigorously kept up to their engagements, and favour shown to "the rich and the litigious," we should never have heard of a Commission being required to investigate grievances."

PART IV.—RECOMMENDATION OF THE COMMITTEE.

91. I do not propose to discuss the recommendations *seriatim*. The points on which alterations in the system are considered to be desirable have been generally indicated, and they will now be specifically detailed. Several of the recommendations made by the Committee involve an alteration in the law which it may not be convenient to take up at present, and accordingly the system proposed will have reference to the existing law, the further changes possible, only after the law has been altered, being separately noticed.

The question of rates will first be considered. This is what the Committee says on the subject:—

"Although the present rates will not be considered high by those who are accustomed to irrigation in other provinces in India, we found in our enquiries that the most universal complaint against the irrigation system in South Behar was 'the excessive rate.' So general indeed and persistent were these complaints that we are satisfied that no remedies we may suggest, no improvements we may devise, will be accepted by the people as any adequate outcome of the results of this Commission, unless they are at the same time accompanied by a substantial reduction in the water-rate. In deciding this question, all the circumstances of the Some irrigation must be considered. It must be remembered that canal irrigation is unpopular. It is alleged that Some water is injurious to the soil, to man and beast. It must never be forgotten that an old system of irrigating from ahurs and pynees prevailed before its introduction, which the ryots declare was more beneficial to them than the present system which has superseded it. It is admitted that well irrigation is more beneficial to the crops than canal water. The country is to be water-logged; the health of the people is said to have suffered. The vigorous and often injudicious assessment of water, combined with the energetic realisation of the existing rates, has embittered both zamindars and ryots."

Further on they say:—

"There are those who speak favourably of the canals and of the good they have rendered the country. But the preponderance of testimony, including that of the most moderate witnesses, is in favour of a reduction in the rate."

It would be strange if the purchasers were not in favour of reduced prices. The fact is that canal water is indispensable, and that the one matter in which there is still real interest in the proceedings of the Committee is in that of rate. In a late publication, to which reference is made in paragraphs 134 to 140, Baboo Kandhji Sahay, B.A., B.L., Secretary to the Co-operating Committee, observes:—

"Such is the summary of the recommendations of the Commission. I shall begin with the last, for the lowering of rates, first, as being the most important, and without which, in the words of the Commission, no improvement will be accepted as an adequate outcome of the results of the Commission."

92. Practically, the discussion of rates may be confined to that for rice, which is comparatively of overwhelming importance, and the rate for five-year leases, which the Committee propose to reduce from Re. 1-4 to Re. 1 per local *bigha*, is that which must rule the other rates.

93. It must not be forgotten that the validity of every one of the reasons given by the Committee as a reason for reducing the rate is strongly contested.

It is stated that canal irrigation is unpopular. In the last two years practically the whole of the water available in the *kharif* season has been disposed of. It is suggested that this demand, which cannot be questioned, is partially at least due to the *aharas* having been rendered useless. The fact is that in the jungle portion of the Jugdeopore estate, where there were no *aharas*, not only has the transformation from *rabi* to *kharif* cultivation in the land irrigated by canal water been complete, but the inhabitants of Belgaoon, who could get water from one of the half dozen efficient *aharas* in the district for nothing, positively prefer to pay Re. 6,000 a year for the regularity and convenience of canal irrigation.

One apparently strong instance illustrating the assertion made that *aharas* have been destroyed by the canals is repeatedly referred to as a convincing proof of the fact,

though it is in the same page* of the report admitted that the Engineers took immediate steps to remedy their own mistake.

94. It is stated that the Sone water is injurious to the soil, to man and beast. The crop experiments made by canal officers are derided. Experiments made by an independent civil officer and by an eminent firm of European semindars show that exceptional crops averaging 30 maunds of paddy per acre are grown on almost every variety of soil, including

keval, which is repeatedly asserted in the report to be injured by canal

water. The average of the Canal officers' experiments to date is two maunds per acre less than the estimated yield of average crops in a year in which there was no rain in the *kharif*: so that the crops depended on canal water only, and more than ordinary loss might have been anticipated.

95. The injury to *aharas* is strenuously denied by the Superintending Engineer, who even considers that their effective supply

has been increased by the extra quantity of drainage water they must necessarily receive from the canal water poured over the country. It is not denied that well irrigation is superior in the case of opium, and the crop experiments show barley, but the chief crop, rice, is not irrigated by wells, and wheat appears to thrive equally with well or canal water.

96. These are general terms are the replies of the Canal authorities. A special civil officer was deputed to investigate the subject with special reference to the rise or fall in the rent of lands irrigated by the canal. This is what he says on the subject:—

"I have recorded in my note-book statements gathered on the spot as to the increase of rents throughout the villages irrigated. I will give a few examples only. In experiment No. 2, the village Danwar has been held by—in *thika* from the Dumraon Raj for 20 years; the ryots are nearly all Rajpoots and claim that their holdings are *guzastha* (i.e., with a right of occupancy at a low rent); they say that—is demanding an increase of 5 annas a *bigha* rent, simply because the lands have been increased in value by the regular crops they now get from canal water in place of previous precarious outturn. In experiment No. 24, 15 annas of the village is held by Baboo—, an Arrah pleader, who filed a long written statement before the Committee asking for a reduction of rates. From the shareholder of 1 anna, the putwari and the ryots, I found that the *jamabandi* of this village has risen since the opening of the canals from Re. 1,200 to Re. 3,200. I was told that no ryot is considered to have any right of occupancy except those specially declared *guzasthadars* by the courts; no *puttas* are given, and rents are regularly increased. This village lies between the Koilwar branch and the Arrah main lines close to their junction. Experiment No. 25 bears more directly upon the question of the rate. The whole area under cultivation is only 23 *bighas*, most of the village having been acquired for canal works; the area being below 50 acres is too small for a five-year lease, yet a mahajan, who foreclosed a mortgage

upon the cultivated lands, is content to irrigate *dhan* year after year paying Re. 1-14 a *bigha*. Similar instances to these will be found throughout my note-book.

"Mr. Odling in his minute of dissent from the Committee's report in paragraph 19 stated:—'It was not to be expected that the semindars or cultivators would care to bring before the Committee cases in which the value of their property had been increased. A road cess revaluation will afford some means of estimating the value of the canals on the value of the landed property in the district affected.' I have accordingly endeavoured to analyse the figures filed before the Collectors under Act IX of 1880 and its predecessor and to compare them with the areas upon which canal water has been regularly taken.

"The periods when the road cess returns were filed are extremely convenient for comparison at the present time. The last returns were filed last year, and the former returns in 1876 A. D., when canal irrigation was just commencing.

"To make the comparison, I first obtained from the Engineer a list of all the villages in which the areas now under five-year lease exceed 40 *bighas*, and then identified them with the Collector's maps. This was a work of some little difficulty, as in some cases I found that in order to secure a 'block' pieces of another village had been included. I then consulted the original papers, and the landlords or their representatives, referring to these villages. As from my previous connection with the districts, I was personally acquainted with the officers in the Road Cess Departments in Shahad and Gya, I found little difficulty beyond clerical in the Summary valuation by the Collector I have taken no notice of all returns which on comparison were obviously wrong, I rejected. Little exception can therefore be taken to the figures given.

"We then get this result:—Taking canal water upon one-third the area of a large number of villages enables the semindars to increase the rents per *bigha* in these villages at least 10 per cent. more than he could otherwise; in other words, regular canal irrigation enables the landlord to obtain 30 per cent. more from the land than he would obtain without the canals.

These results seem to me to have a very important bearing on the question of the reduction or increase of the rates for water. The extra increase of rent is the true test in South Behar of advantage derived from canal irrigation. As the Rent Law Commissioners on page 73 of volume I (1880 A. D.) wrote:—'Enticement on the ground of increase in the value or price of the product is a stern reality to the ryots of Behar. While in Bengal the ryots are the stronger and the landlords the weaker party; in Behar it is just the reverse, the ryots being (save in some exceptional places) in a depressed condition, and incapable of maintaining against their landlords the rights given them by law. The Bengal Tenancy Act, 1845, is tending to improve this state of things, and the new prescribed form of receipt is being adopted, though it is far from general. But the figures comparing the irrigated and unirrigated villages above mentioned relate to times before the Bengal Tenancy Act became law, and I have no hesitation in stating in regard to the estate in particular, and to almost all the estates in the Sone Circle, except the Dumraon Raj, where there are Raj *guzasthadars*, that any improvement in the amount or value of produce eventually finds its way into the pockets of the landlord in both *dhawli* and *nagdi* tenures. Reduce the five-year lease to four annas (i. e., 50 per cent.), and the landlord, conscious or unconsciously, will eventually get his rent-roll increased by 40 per cent. on the land irrigated.

"I may here mention that in my opinion the improvement above is in no way due to the superior fertilising power of canal water. I know of no material difference between the Sone and the rain water stored behind bunds. Putting aside the improvement of area under cultivation, improvement is due, it seems to me, to two things—(1) the substitution of the easily grown and more profitable *dhan* for *rabi* and inferior crops; (2) the considerable rise in the average annual outturn by a full crop being always secured instead of outturns varying with unsatisfactory rainfalls.

"All the figures given in this paragraph practically relate to the only. In the figures for the three districts only five-year leases are considered; in *mehal*—, *dhan* on annual lease is included as the percentage of *dhan* in five-year leases is more than 83 per cent. (cf. Superintending Engineer's annual revenue report for 1888-89, paragraph 4, where he also writes that 'five-year leases are practically long leases for the irrigation of *kharif* crops only'). Consequently we are right in considering *dhan* as the crop which has caused the great increase in rents.

* From the figures given in appendix No. II, it will be seen that the area on the average in the years 1883-84, 1884-85, 1885-86 A.D. in the irrigated villages was 100 per cent. of the former cultivated area in these villages, 80-90 per cent. of the former cultivated area, and 80-90 per cent. of what this increased cultivated area would have been if it had only increased at the same rate as in the unirrigated villages.

All the figures given above I can personally vouch for; the calculations have been tested in the offices of the Superintending Engineer of the Sone Circle and the Bengal Secretariat."

As regards the *aharas* he observes—

"If the majority of the Commissioners had seen the rice crop this year, which was not irrigated from the canals, I feel sure that they would not have written in paragraph 276 of their report as one of the reasons for the reduction of the rates that 'It must never be forgotten that an old system of irrigation from *aharas* and paynes existed before the introduction of the canals, which the ryots here were more beneficial to them than the present system which superseded it.'"

It is only by seeing the crop on the ground in a season like the present, when the *Hutia* and *Chitra* rains entirely failed, that a clear comparison can be made of the two systems."

Mr. Power, the Collector of Shahabad, is of opinion that a case for reduction in the *kharif* rate has been made out. He observes:—

"Paragraphs 275 to 290.—Admitting the force of the arguments summarised in paragraph 275, and adding that the history of the canals with their expensive head works designed for a very much larger scheme would admit of anything like a commercial rate, I am still of opinion that a rate of Rs. 1-4 per *bigha* for leased areas is not too high, and that a case has been made out for reducing it. The bulk of legitimate complaints refer to 'unauthorised irrigation' charged for at Rs. 1-14 a *bigha*, or, if penalty rates are imposed, Rs. 3-12. There is no general complaint that the five-year lease rate of Rs. 1-4 a *bigha* is too high; the evidence cited in paragraph 277 does not prove any-

thing relevant to this issue. Owing to a number of causes irrigation in the Dumraon estates has resulted in friction; it is unpopular, but the Revenue and Public Works cess, so is the Income-tax, and every institution that takes cash out of pocket without an immediate return, no matter what benefit, past or potential, may attach to it.

Mr. Sulano's villages referred to were practically beyond the reach of canal water, and for a couple of years they suffered because regular supply was available: this is no reason for reducing the rates in villages where water can be supplied, though it might be one in differential rates. The Behera firm does not press for a reduction of rates; it is obvious why tenants of their village mentioned request them to spend a large sum on repairing an *ahar* which serves for irrigation in ordinary years, save Rs. 6,000 a year, and that sum available for payment of rent. It may be assumed as a fact that in a year of scarcity the villagers wanted canal water, and water (though intended for others) was in the canal, they would not complain: see also my remarks against paragraphs 41 and 42, and other rates proposed I concur with the Committee."

98. The following remarks are taken from a note by the Hon'ble Mr. Nolan:—

"The whole report of the Committee seems to be directed towards showing that an exception should be made to this primary rule of financial justice in favour of Shahabad. As a former Collector of the district, having many associations with its people, my personal sympathies are by no means opposed to such a course; but I own that it appears to me unjust and the reasons urged in its support unsound. These reasons, as summarised in paragraph 276 of the report, headed 'Necessity of some reduction,' and opening with the passage quoted above, are (1) the desire of the Commissioners that changes to be introduced should be accepted by the people as an inevitable outcome of the Commission; (2) that canal irrigation is popular; (3) that it is alleged to be unprofitable; (4) that it is said to be injurious to health. On the first of these considerations comment has been made above, and I will proceed to deal with the other reasons, in so far as they can be considered to be grounds for reducing the water at less than its value."

"With regard to the unpopularity of irrigation, if the expression is taken as synonymous with a failure in the effective demand for water, it is obvious that, under a system of free sale, this consideration must be decisive. If ryots do not consider that it pays them to pay Rs. 1-4 an acre for canal water, and to suffer such inconvenience as is entailed with the Department entail, they will not send in written applications for leases, and the rates must be lowered. In that case there is a commercial necessity as well as an act of justice. And I may remark that if, as sanguinely suggested in paragraph 293 of the report, a reduction in the rates is considered to be desirable in the public interest of the revenue, as facilitating retrenchment and the extension of irrigation, there is no objection to the proposal, or rather it should be supported from a financial point of view. That is a financial question, as to which I can only remark that, considering the favourable character of recent seasons in respect to rain, there is no falling off in the demand for water at existing rates, and no supply of water available for the extension of operations at the most important season of the year. But the unpopularity referred

to by the Committee is of a different kind. It is consistent with a brisk demand for water at current rates and under the existing system. It finds its expression in attacks upon the canal administration, made by those who would, nevertheless, resent the cutting off of their water as the greatest possible calamity. These attacks may be most just, or they may be altogether unfair, but as affecting rates I submit that they are irrelevant. If individuals are to blame, they may be punished; if the system is in fault, it can be altered where found defective: but the principle that fair rates should be levied in the interest of the tax-payer must, nevertheless, be maintained. These rates were not fixed with a view to attracting local popularity, and cannot properly be altered with that object. If they were reduced on this ground, we would soon hear of the unpopularity of irrigation rates elsewhere."

"With regard to the assertion that irrigation at the present rates is unprofitable to the cultivator, I fail to reconcile it with the fact that he applies for the water. He cannot do so for his pleasure only, and the inference is that he does so for his profit. That he depreciates the article he buys is no matter of surprise: most purchasers act in this manner where by so doing they can hope to influence prices. I presume the members of the Committee did not expect to hear the purchasers of water state how it had converted barren and into valuable estates with large profits to the owners, or to infer that the rates they paid should, therefore, be enhanced."

"I may say that when I was Collector of Shahabad—an office which I held during the five years ending with 1884-85—no one appeared to doubt that irrigation had, on the whole, been profitable to the district. The system was then extending; indeed, the area under irrigation doubled during the period. And coincident with its extension was observable a degree of at least comparative prosperity clearly distinguishing the inhabitants of north Shahabad from the poverty-stricken population of the surrounding districts. Complaints of proper assessment and of the occasional failure of the water-supply were indeed rife, but the advantages of the system as a whole were at the same time acknowledged."

99. It appears that in the light of the facts brought forward by Mr. Luson's enquiry, the information given by the Civil officers consulted, and the fact that the demand for water in the rice season is quite equal to, if not in advance of, the supply, not only is no reduction called for, but the rate might without injustice to the cultivator be raised.

Mr. L. Mylne states that—

Volume II, page 190. "Any raising of the present rates would very probably tend to a combination against canal water."

And taking all the circumstances connected with the appointment of the Committee and the alteration in system now proposed into account, it will probably be better, for the present at least, in the interests of both Government and the cultivator, to retain the present rate, regarding which Mr. Mylne makes the following observation:—

"I am of opinion Rs. 1-4 per *bigha* for all crops under a five-year lease during all but the hot months a fairly moderate charge."

100. This favourable rate should, however, apply in the case of good registered channels only and in situations where suitable blocks involving little or no waste of water can be obtained. It is proposed, with the view of inspiring confidence and avoiding interference with the cultivators more frequently than is absolutely necessary, that the lease under such circumstances shall be for seven instead of for five years. Where the blocks are less suitable, and the channels, though not necessarily involving waste, are less substantial, it is proposed to reduce the term of lease to three years and to raise the rate to Rs. 1-9 per *bigha*. A distinct advantage would thus be given to the proprietors of estates whose arrangements in the matter of canal irrigation were such as not to cause loss to Government. In annual leases the rate would be Rs. 1-14 per *bigha* as at present, but even in their case a suitable block would be insisted on. In no case would irrigation beyond the limits of the block be assessed. The precautions to be taken to prevent the misuse of canal water will be detailed subsequently.

101. For *rabi* irrigation the general rate would be five annas lower than at present, viz., Rs. 1-4 per *bigha* for flow irrigation and 15 annas for lift. In the case of land on selected distributaries not open for *kharif* irrigation the

rate would be 15 annas and 10 annas per *bigah* for flow and lift irrigation respectively. Water would not, in the case of leases at the lower rate, be given before the 25th October, unless the season was one of seasonable rainfall, when the Divisional Engineer would be authorised to open these distributaries by the 7th October, and no water would be given to *rabi* crops after the 25th of March. It is never, as a matter of fact, wanted after that date except for sugarcane and hot-weather crops.

102. *Bhadai* crops would, as at present, be charged Re. 1-0 per *bigah*, but it is intended to include *seerha* in this rate if further investigation shows that this class of rice can be separated from *kortika* and *aghani* without the risk of frequent disputes.

103. The rate for hot-weather irrigation between the 25th of March and the 25th June would be, as at present, Rs. 2-8 per *bigah*, but water would be allowed to be taken earlier for indigo and other crops requiring it, not before the 25th February, provided an equivalent number of days was cut off in May and June.

104. Sugarcane it is proposed to treat in a special manner. At present half the complaints refer to this crop, which is peculiarly liable to damage from other causes than want of water. In 1887 the crop was generally destroyed by rain. Permits would be given for sugarcane irrigation at Rs. 5 per *bigah*, flow or lift, payable about the time the crop was reaped, with the undertaking that, in the event of the crop failing through any cause, a proportionate remission would be made. This rate would include irrigation in the hot weather for which no extra charge would be made. Otherwise canal water taken during the different seasons—*rabi*, hot weather, and *kharif*—would be charged at the rate fixed for the season, without reference to the failure or otherwise of the crop, except so far the rates for the current season were concerned, which would be remitted in the event of failure of supply only.

105. The charges would in all cases be in *bigahs* and decimals of *bigahs*, any smaller area than one-tenth of a *bigah* being charged as a tenth. The Committee's proposal is similar, except that one-eighth has been replaced by one-tenth. The Government will reap a small advantage by *cottaks* being replaced by decimals of a *bigah*; but it is proposed to expend Rs. 75,000 of public money on bridges, over village channels crossing public roads, which will quite neutralise any financial advantages the alteration might give to the canals.

106. There will be some minor changes. When the five-year lease rate was fixed, it was partly with a view of avoiding interference with the cultivators and partly with the object of inducing applications to permit sugarcane included in the block to be watered without extra charge. No alteration in this respect is proposed. It was, however, never intended that water should be given to these blocks after the time when it is ordinarily required for *rabi* crops without extra charge, and the season will, therefore, end on the 25th March, after which water is required for sugarcane and hot-weather crops only.

Mr. Mylne says:—

"I am against hot-weather irrigation, believing that during May and June the land should have respite from canal irrigation."

whilst in the paragraph immediately above he observes:—

"I am decidedly of opinion—and in this I agree with Mr. Solano—that, if for nothing else than cane irrigation, the canal should supply water till, at any rate, the end of April in each year."

In the case of cane irrigation the transaction is, at any rate, purely commercial. If the cultivator does not find it to his advantage to pay the extra rate for canal water, he can sink wells, and it is desirable that he should be driven to consider it in this light as early as possible, and not trust to keeping the cane alive until the 31st March by canal water

and afterwards in April, May, and June by rain, which is pure lottery or surreptitious irrigation. This is what year lessees frequently do at present.

108. Adopting the proposals made in the preceding paragraphs, the water-rates for the future will stand as follows:—

Leases for a term of years.

For water supplied between the 25th of June of one year and the 25th of March of the next.	Flow or Lift.	Flow or Lift.
	Rate per <i>bigah</i> .	Rate per acre.
For leases for seven years—all crops	Rs. A. P. 1 4 0	Rs. A. P. 2 0 0
For leases for three years—all crops	1 9 0	2 8 0

Season leases.

NAME OF CROP.	Date of supply.	Flow or Lift.	Flow or Lift.
		Rate per <i>bigah</i> .	Rate per acre.
Rice and sugarcane for <i>kharif</i> season only	25th June to 25th Oct.	Rs. A. P. 1 10 0	Rs. A. P. 2 0 0
<i>Bhadai</i> , <i>seerha</i> , rice, or any other crops	Ditto to 25th Oct.	1 9 0	2 8 0

In the case of annual leases no extra charge will be made for a crop of *kesari*, linseed, or *gram* sown in rice-field watered with canal water, for these a supply will be allowed to be taken until the 15th November.

In the case of both annual leases and leases for a term of years, water will be supplied for rice seed bed only from an earlier date in June, if the supply in the river admits of this being done.

The following will be the rates for *rabi* crops, including sugarcane leased for by the season, for water between the 25th October and 25th March:—

Season leases.

TIME OF SUPPLY.	Locality.	Flow.		Lift.	
		Per <i>bigah</i> .	Per acre.	Per <i>bigah</i> .	Per acre.
15th October to 25th March.	Water supplied from distributaries open for <i>kharif</i> irrigation.	Rs. A. P. 1 4 0	Rs. A. P. 2 0 0	Rs. A. P. 2 15 0	Rs. A. P. 3 10 0
25th October to 25th March.	Water supplied from distributaries or parts of distributaries from which <i>rabi</i> irrigation only is allowed.	2 15 0	3 10 0	3 10 0	4 10 0

N.B.—In both cases Executive Engineers may, in years when the demand for water for *kharif* crops admits of it, supply water for *rabi* on any date after the 25th October.

The rate for sugarcane treated as an annual crop will be as follows:—

Annual leases.

TIME OF SUPPLY.	Flow or Lift.	
	Per <i>bigah</i> .	Per acre.
First of January one year until the crop is cut, which may be March in the following year	Rs. A. P. 6 0 0	Rs. A. P. 9 0 0

hot-weather rate will be as follows:—

Season leases.

		FLOW OR LIFT.	
		Per bigha.	Per acre.
Water supplied between the 25th March and the 25th June, or at the option of the applicant, between the 1st of February and the 25th of May, for crops.		Rs. A. P. 2 8 0	Rs. A. P. 4 0 0

The water-rates will be due and payable on the mentioned below :—

10-year leases	{ One moiety	... 15th December.
20-year leases	{ One moiety	... 1st March.

Season or annual leaves.

... 1st November.
... 15th December.

and crops classed as <i>rabi</i> , including	...	15th December.
garden waterings from the 25th	...	...
October to the 25th March	...	1st April.
weather rate	...	1st July.
garden, full an-	One moiety	15th December.
al rate.	One moiety	15th February.

Divisional Canal Officer will endeavour to forward as of the demand statements as possible to the Collector days before the dates fixed for payment, but accuracy individual charges should be regarded as of more importance than a rigid adherence to dates.

leases issued during the *kharif* season will be to the following general conditions:—

1. Preliminary applications for seven or three-year leases must be made by the 1st of April at the latest. The word preliminary is used, as the regular application cannot be prepared until the measurement is complete, so that the correct area may be entered opposite each cultivator's signature appended in the presence of a witness.

Water will not be supplied until the application has been signed by all the occupiers of the land to be irrigated and a permit issued. If there is delay in obtaining the signatures and water is immediately required, it may be given on annual lease permits issued under the conditions noted below, which will be cancelled, provided the application for a seven or three-year lease is completed by the 30th of November, or with the special sanction of the Superintending Engineer the 1st March following.

- II. Annual leases will be on the same conditions as regards the block being strictly defined, but the measurement will not necessarily be made before water is given, an area more or less being entered in the application in which the boundaries of the land to be irrigated will be specified. The application will state that the actual area measured within the boundaries specified will be charged.
- III. The permit will consist in effect of a copy of the application with the permit endorsed on the back. In the permit the size and position of the outlet, head of water to be maintained, and approximate discharge will be mentioned. No alteration in the outlet will be allowed during the currency of the lease without the express consent of the lessees.
- IV. The permit will state that water is to be supplied for the sole purpose of irrigating the lands mentioned therein. This, of course, includes the right to *nigar* or drain the lands at the proper season of the year. It will be expressly agreed in the application that water-rates will be chargeable whether or no rain falls, and water is required and supplied.
- V. It will be noted in the application that no claim for remission will be entertained unless an application is filed 20 days before the crop is cut, on a form which will specifically state the names of the cultivators and the areas for which remission is claimed. A suitable form will be supplied at the cost of half an anna, but its use will not be compulsory, provided the required particulars are given.
- VI. Leases, whether annual or for a term of years, will be granted for well-defined blocks only, and in the case of the latter the lease will be refused, unless the block includes all the land which Mr. Mylne, volume II, would ordinarily or probably be irrigated. The block must therefore have well defined boundaries. The principle would be applied in the case of annual leases, but somewhat less strictly, as the lease need not be accepted in the following year if it is found that water is allowed to be wasted or so be used for irrigating unleased lands. On the other hand, land too high to be irrigated by flow will, at the discretion of the Canal Officer, be excluded from the lease, which will be for water at the level it can be delivered under existing circumstances, without its level being raised by cross bunds or other temporary appliances.
- VII. Under no circumstances will unauthorized irrigation from water supplied to land under a *kharif* lease be measured or assessed. If water is found to be flowing beyond the boundaries of the lease, the outlet will be temporarily closed. In the case of leases for three or seven years, power will be reserved to the Superintending Engineer to cancel the lease with the concurrence of the Collector, if water is habitually wasted or used

for purposes of unauthorized irrigation, and also on the applications of all the signatories for good cause. Such leases will likewise be liable to be cancelled on the application of the Collector if, on the 1st of June of any year, water-rates are in arrear by more than half a year's demand. These conditions will be recited on the application form.

VIII. The only condition under which unauthorized irrigation in this season will be assessed, will be when a village channel has been cut and the perpetrators of the offence cannot be traced, in fact where a criminal offence has been committed. In such cases the papers will be submitted to the Collector before any measurement is made, and assessment only made on his order after such enquiry as he may consider to be necessary.

IX. The Divisional officer may, at the request of the Collector and with the sanction of the Superintending Engineer, refuse permits to the cultivators of villages where there have been constant difficulties in realising water-rates unless half the amount specified in the permit is paid in advance.

111. These conditions apparently fully meet those stated by Mr. Mylne to be necessary in the sentences quoted below:—

"No question of liability for rates would arise in the case of long leases. But because for various reasons considerable areas of the district are unlikely to come under long leases, safeguards must be provided to secure equitable assessments in respect of such areas, whenever canal water may be supplied. It is difficult to suggest any other plan than the following:—

"1. Sufficient water to be arranged for on written application for irrigation of the whole or major portion of well-defined blocks beyond which no charge for illicit irrigation should be made.

"2. Such application to render cultivators liable for rates on the crop, except on undoubted failure of supply, ascertained promptly by the aid of established gauges and from the appearance of crops. Liability to rates would remain whether or not rain fell during the irrigation of the block with canal water."

Unfortunately under the system mentioned, two evils will arise. Unanimity is required and a small minority may object, and in the words of Mr. Mylne—

"It has always been found that such minorities refuse to join any contract on application, believing they can enjoy the benefits of canal water without paying for them."

The other is that in most cases no punishment or penalty can be inflicted in the case of unauthorized irrigation, it being usually impossible to detect the actual offenders and to secure a conviction in a criminal court. A higher charge for the water, which is in many respects the most appropriate penalty, is deliberately abandoned, as on the whole this remedy leads to greater evils than the disease which it is intended to cure.

112. It might and frequently will happen that after the 1st of September there is a pressing demand for water, when, as frequently happens, the *katiya* rains fail. The quantity of water available to meet this demand is at present and is likely to continue to be very limited. Crops supplied with water at this late period of the season, though greatly benefited, produce indifferent crops. There are always difficulties both as regards assessments and collections. Villages irrigated in October 1888, at the urgent request of the Collector, have failed to make any payment whatever, and in many cases though canal water was used, no assessment was practicable. The whole available staff is required to distribute water to the leased areas, and they cannot be employed in examining blocks proposed to be leased. The only possible solution of the difficulty appears to be in such cases to sell the discharge of an outlet for a limited

time after the leased areas have been supplied. In such a charge of four rupees for one cubic foot per second twelve hours will be made, half being payable before outlet is opened, and the other half secured by a without reference to the area to be watered. The proposed is rather less than one rupee per *bigha*, but will be considerable wastage.

113. The charges to be made for water supplied before the end of the *kharif* season, say, the 25th October and 25th March, require little comment.

A considerable reduction has been proposed to be made in the rates for *rabi* crops. It is necessary to impose a higher charge, where water required for *kharif* crops is utilized, as water is certain to be taken, and it will interfere with the supply required for the rice crop at the critical season. But the reduction in rate proposed to be made varies from 20 to 40 per cent. In the case of sugarcane the rate proposed is somewhat less than the present charge, and its realization will be dependent on the crop coming to maturity. If the cultivator takes water for part of the year only, he will be charged the rate appropriate to the season, and no claim for a reduction on grounds other than failure of supply will be allowed. *Serha* rice, which is harvested in September, is included under the head *bhadai*, and the rate for it is consequently slightly reduced, whilst the time at which water can be given for the hot weather rate has been made variable to suit indigo and other crops requiring water in March.

114. The strict provisions proposed to be made against unauthorized irrigation in the *kharif* season, 25th June to 25th October, will not apply to irrigation at other times of the year, when the canal officers will exercise their powers, regarding which there have been no real complaints. This is in accordance with the Committee's recommendation quoted below:—

"But there is always ample water in the canals and distributaries during the *rabi* season. The canals run to waste into the Ganges; there never any complaints of insufficiency of supply at this time. If there are any complaints of assessment of unauthorized irrigation regard to *rabi* crops. The object of the fixed daily system is to put an end to these complaints, but where there are no complaints there is no advantage to be gained by its introduction. The simplest arrangement for the *rabi* season will be to follow the practice which now prevails, and allow the land under lease to take just as much water as they require for their *rabi* crops. If they abuse their privilege, and allow water to flow on the lands of others, these lands will be liable to assessment. But the experience of the past is the strongest reason for assuming that the privilege is not abused."

115. In the existing rules it is provided that in the case of land held on a *bhaoli* tenure the water-rate shall be coverable from the cultivators and zemindar in the proportion as the produce is divisible among them.

It has been held as a matter of law that the zemindar can only be made responsible where the application for irrigation is signed by him. There are great difficulties in obtaining signatures of zemindars, who frequently reside out of the district, and there are often numerous shareholders. In many cases the ryots have made themselves responsible for all the water-rates rather than get water or wait an indefinite time until the zemindars are willing to sign. An alteration of the law on the lines recommended in paragraph 22 of the Committee's report is desirable, but in the meantime the legal rule for the practical guidance of canal officers is required.

The matter is very fully dealt with in Mr. Lusson's report from which the following extract is quoted:—

"The position of affairs will be more clearly illustrated by the subsequent history of the case which led to the statement now in question. It referred to one of the Doonraon villages after it occurred the representatives of the Maharajah

with the ryots any leases last *kharif* season on *bhaoli* lands, notwithstanding that, hitherto they had paid half the rates, and notwithstanding that as far as I could ascertain, every other landlord (one) in the circle consented to share the rate. The consequence was that in a number of the Doomsraon villages water for rice was taken by the ryots, and with the failure of the *Huthiya* rains died. It was the *rabi* sowing time when I commenced my duty: the sowing rains held off; still the representatives of the ryots refusing to agree to half the charge of the water the ryots were asking for, till the Collector of the district, at my request, the case of the ryots upon the Dowan, and induced him to give notice that the Raj would this season share half the irrigation, so far as *rabi* only was concerned. In 15 *bhaoli* villages belonging to the Doomsraon Raj, *kharif* was irrigated by canal water, by the ryots last season on their own responsibility. In 15, no doubt, afford to pay the extra tax of 15 annas, as I am informed that by law the *malik* could not be charged; but I heard that they meant to deduct the value from the rent *malik*—a state of affairs likely to lead to unseemly

It can be no question that the only settlement of the matter at present practicable involves possible injustice to the ryots, but it is better that he should be able to procure water at even an enhanced price than allow his crop to fail. I proposed that in future the cultivator shall invariably be himself responsible for the whole of the water-rates, and that the canal officer shall be authorised to issue a permit and supply water on his written application.

It will be made in the rules that on the written application of the *zemindar* any specified proportion of the water will be recovered from him, but it will rest with the *zemindar* and not the canal officer to procure this authority from the *zemindar*, or to take action under section 40 of the Tenancy Act if he is so advised.

SUPPLY AND REGULATION OF WATER.

This point must be viewed from three different points. In the *rabi* season there is always an ample supply, and the tendency of cultivators has been towards over-irrigation. In the hot weather, April, May and June, the want of water in regard to the supply of water can be given. In the *kharif* season the demand for water at times is in excess of the supply, and it is necessary to exercise great care both in granting permits and in regard to the situation and suitability of the blocks to be irrigated. The bulk of the irrigation is in the *kharif* season, and it is in regard to the supply at that time that the greatest care is required. The principles to be followed are thus recommended by the Committee—

It is essential to the proposals we are making that the canal officer should be allowed to select his own area for irrigation. This area should be let on lease under conditions we shall explain. The canal officer would not grant a lease for a block of land unless the outlet or outlets from the distributary could furnish the water, and he would refuse a lease if the area applied for was insufficient to take the full supply of water which would be furnished by the outlet. He would be guided in his judgment by the fixed duty of water. It is of course not intended that the duty should be arbitrarily reduced or enlarged so as to bring the exact area commanded by the outlet. A small margin for the other would exist in all cases. It will be better to err on the side of liberality than of strictness. But the canal authority should be allowed the power of refusing a lease at discretion."

In the last two years irrigation has been conducted in the manner suggested. The outlets have been made to discharge approximately the quantity of water required (arrangements having been made to procure water six inches in diameter) and leases for blocks, in the strong probability of unauthorised irrigation, or of a discharge which could not be efficiently arranged have been declined.

Since the Committee's report was written valuable results have been gained.

In 1888 there was practically no rain from the 7th to the 29th November, and the rice crop depended

on canal water only. Practical results, the fruits of this experience, will be followed in preference to any particular scale of duty, and in all cases special care will be taken that the lessees shall know exactly what outlets will be allowed, the essential particulars regarding which will be entered on the permit. The rules will provide that general instructions issued from time to time on this subject must be followed. The ordinary base will, taking the rice area included in the block only into account, be for a duty of 50 acres per cubic foot per second on the discharge from the outlet with a *fatil* of five days in 15; but this duty will be liable in places to be reduced to 40 acres per cubic foot per second, or increased to 65 acres per cubic foot per second, where it has been found by experience that this latter duty can be obtained. Where the supply required is in excess of the lowest duty mentioned, the lease will ordinarily be declined. It would be an obvious loss of power to use the canals as a means of growing rice in soil which is practically in the condition of a filter bed. Such soil is suitable for *rabi* crops only.

The division of leases into seven-year at a lower rate and three-year at a higher will also afford a means of differentiating leases in unfavourable situations. Seven-year leases will only be accepted where it is positively known from former experience that a sufficient supply of water is always available, and that the quantity required is not excessive.

118. The department will accept and ordinarily exercise full control over and responsibility for the supply of water through the outlets. It will, however, be provided in the rules that, with the consent of the lessees, the custody and control of any outlet may, by an order in writing of the divisional canal officer, be made over to the *lambaradar*, provided the latter is willing to undertake the charge. The delegation will not impose on the latter any responsibility with regard to unauthorized irrigation to which he is not otherwise subject. The *lambaradar* will take charge as a matter of convenience to both the lessees and the canal department, and if the latter are not satisfied with his conduct they will resume charge of the outlet themselves. It will always be part of his duty to close the outlet in accordance with orders received from proper authority.

VILLAGE CHANNELS.

119. The Committee recommend—

Volume I, page 93, recommendation XII. "That the construction of water channels be undertaken by the Canal Department, and that a suitable charge of from two to four annas a bigha be added to the water-rate as channel rent."

With this recommendation Mr. Odling found himself unable to agree. Very many of the leases are at present supplied

Volume I, page 97. the leases are at present supplied with efficient village channels—not less than 185 miles have been made by canal officers at the cost of *zemindars*, and in the construction of much more than that length they have given advice and assistance. It is difficult to say what upwards of 1,000 miles of village channels would cost to construct, more especially as land would have to be acquired for maintenance purposes, and its price in the immediate neighbourhood of the canals has through their agency been largely raised. It has been ascertained that the road crossings alone will cost Rs. 75,000, and altogether it is not likely that less than three lakhs of rupees would suffice. The maintenance charges would be Rs. 20,000 a year, whilst in private ownership it is doubtful whether one quarter of that sum is expended, the cultivators being willing to carry out the repairs to a large extent without payment. The real difficulties are the road crossings and the length of some of the village channels which are *de facto* minor distributaries. It is proposed (I) to construct all road crossings required at the cost of Government; (II) to allow no village channel exceeding one mile in length to be constructed in future, and (III) except in the Jugdispore Estate, to take over and

maintain at the public cost any village channel already constructed which is in reality a distributary, provided it is made over to Government without charge.

120. There is no objection to its being laid down by rule that channel rent shall not be less than two or more than four annas a bigha, and, in the case of seven or three-year leases to recovering at the written request of the semindar the channel rent together with the water-rates. But in such cases it will be necessary for canal officers to be placed in a position to keep the channels in a proper state of repair. It is not desirable to impose the collection of channel rent on the Canal Department as a duty. In some cases Messrs. Burrows, Thomson and Irvine may be taken as an example; the landholders have deliberately refrained from asking for channel rent from their own tenants, and in others, where the land is *bhooli*, it is doubtful whether any rent can equitably be charged. Mr. Luson is of the contrary opinion, remarking that—

"Certainly he should at least pay for the construction of village channels."

121. The majority of the Committee look with much favour, not fully shared by the departmental member of the Committee, on the proposal to sell water for the supply of *aharas*. Mr. Odling considers that it is a matter in which great caution is required. It is recognized by the Committee that there is a risk of further water-logging the country, and that a supply could only be given when water is available without prejudice to leased areas.

The price proposed, one rupee for a discharge equivalent to a supply of one cubic foot per second for 12 hours though low, may be tentatively accepted, provided water is supplied from November to March only. To the supply of water in the months when the river is in flood, and the water heavily charged with silt, there is not only the grave objection of water-logging, but there is the imminent danger of the canal being silted up if constantly run at full supply. At present there are 14 steam dredgers at work, and it is with difficulty that the canals are at times kept open. Every extra cubic foot per second of supply deposits in the canal its quota of silt which must again be lifted out by steam power. It is therefore undesirable to fill *aharas* with canal water in this season at all, and, if allowed, a double charge sufficient to pay for the extra expense necessarily incurred should be levied. It is, however, in March, when the permission to take water for *aharas* will probably be most valued. The supply in the river in April, May and June is scanty, and generally there is no surplus water available for sale then.

ASSESSMENTS AND COLLECTIONS.

122. The arrangements in these respects will remain much as at present, with the important exception that in the *khari* season the areas included in the application will generally be measured at an earlier date than at present, and without reference to the patrols' *shudkar* or register of irrigation, which will be retained in a modified form to record the discharge through outlets. There will practically in this season at least be no unauthorized irrigation.

The Committee's recommendation has been followed except with regard to the increased number of Sub-Deputy Collectors it was proposed to employ partly for the purpose of disposing of complaints, and partly to admit of the localisation of the offices with the view of facilitating the collections.

So far from it being likely that an increased revenue will be derived from the canals, it is nearly certain that the reverse will be the case. Though the area watered by the canals is steadily increasing, the assessments are decreasing owing to the extension of five-year leases. It is hoped that the work of the collection department will become lighter as these leases, which imply regular annual payments, extend.

The proposals of the Committee by no means diminish the functions of the Special Deputy Collector, who is in favour of the retention of the office of Deputy Revenue Superintendent and the employment of four Special Deputy Collectors, whose functions would typically be those discharged by the Sub-Deputy Collectors at present employed. Four sets of buildings for their residences and offices are asked and there would be extra office establishment in addition. The addition to the work now carried out by the collection department proposed was the disposal of complaints and preparation of alteration statements.

123. It has been shown in paragraph 78 of this note that nearly half the objections to assessment raised were admitted by the canal officer to be correct and the necessary orders passed. A reference from another office have led to the same result, but with a very appreciable delay and extra trouble and work resulting in increased expense to Government in both departments. It was pointed out that on general grounds it was only that the canal officer should be given the opportunity of correcting what was alleged to be an erroneous order. It is admitted that cultivators or others—

"Should be able to present any complaints or objections they have to make as to the effect of orders by the Engineers before an independent tribunal."

The word *orders*, which has been italicised, is the key-note to the case. All that is asked is that the Engineer should be given an opportunity of passing an order.

The actual alterations in the position of the collection department proposed are—(I) that orders regarding assessments passed by sub-divisional canal officers should be appealable direct to the Collector or to an officer in this respect with the powers of a Collector, the immediate appeal to the divisional canal officer being abolished; he will, however, continue to exercise revisional powers; (II) that the Deputy Collector shall be vested with power to sanction alterations in the demand not affecting the amount due, in certain cases remissions, and to finally settle with certain classes of irrecoverable items. It is believed that this extension of the functions of the collecting department, which will materially lessen the number of complaints, can be carried out with the establishment as it at present stands, or at least without any material addition thereto.

124. I am altogether opposed to the creation of any new class of Canal Deputy or Sub-Deputy Collector, or to an increase in their numbers, which I do not think is called for, and as regards the former objection I find that it is supported by the Board of Revenue. The circle offices Daudnugger and Bikrum fill the same position as occupied by the Sub-Deputy Collectors in Shahabad; their charges are materially less important and no important alteration is called for. The expediency of placing collections in Patna and Gya under the Special Deputy Collector, Shahabad, may be reserved for further consideration.

125. With the exception of a sanctioned office establishment, the Special Deputy Collector, Shahabad, is dependent on the amount placed at his disposal under the sanction of the Collector for the payment of his mofussil establishment. With the sanction of the Collector he appoints circle officers, *tehsildars* &c, on pay from Rs. 50 per month and downwards, the amount not exceeding 2½ per cent. on his collections for the year. On this subject the Committee observe—

"As a fact, what is realised as *tehsildars'* fees is, we believe, paid away as commission, but is deducted from the payment of fixed salaries to the circle officers and even to circle officers. Such a system may easily give rise to misunderstanding. We are of opinion that no value commensurate with the expenditure incurred is obtained by the payment of fees either to *tehsildars* or *patwars*. It is a better arrangement not to allow fees. The collection

Volume 1, page 78.
Volume 1, page 96.

Volume 1, page 79, section 253.

Volume 1, page 78, section 250.

Volume 1, page 81.

think, to be made as in other departments by establishments a fixed salary without commission. We have therefore omitted altogether as an item of expenditure in future arrangements."

The only real objection which can be taken to the principle laid down by the Committee that fixed salaries shall be paid on the score of expense. The Deputy Collector makes the strongest objection to the limits proposed by the Committee, so far as is supported by the Collector.

The matter is one which will have to be considered in detail with special reference to Mr. Power's remark that power should be reserved to dismiss men at times of year when their services are not required. The so-called circle officers could certainly be appointed permanently and graded as *zilladars*. Six *zilladars* as proposed by Mr. Power would replace the present establishment of seven circle officers. For the remain-

ing establishment a limit should be fixed within which the Collector should be authorized to entertain such establishments as might be required, but the collections are diminishing and not likely to again show any important recovery, so that it is indispensable that the total expenditure shall not exceed that at present incurred. The grant of a local allowance to the Special Deputy Collector has been repeatedly recommended by me. It should, I think, be attached to the appointment, which is very important, rather than be left to the officer filling it at any particular time.

INTERMEDIARY AGENCY AND LAMBARDARS' FEES.

126. When irrigation was first commenced, an attempt was made to appoint *lambardars* who should both transact business on behalf of the cultivators with the Engineers and act as the Deputy Collector in collections. One moiety of their fees, then 10 per cent. on the assessments, was payable by each department. The arrangement was not found to be satisfactory; the canal officers and the collecting department were not always in accord as to the merits of particular *lambardars*, and eventually the fees, reduced to 6½ per cent., were divided, the collecting department taking 3½ per cent., the sum now at their disposal for the payment of circle officers *tehsildars* and others whom it was found expedient to pay on monthly salaries, and leaving 3½ per cent. to canal officers for the payment of *lambardars* who ceased to have any connection with the collections, but continued to act on behalf of the cultivators in matters connected with the presentation of applications, the receipt of permits, and the distribution of water amongst the signatories to the lease.

The *lambardars'* fees amount to a considerable sum, and their abolition would result in an appreciable saving to the State. Real work is, however, demanded from them, and it is proposed to increase both their duties and their responsibilities. They are required (I) to attend all measurements; (II) to obtain signatures to applications and to certify to the correctness of the same; (III) to attend to the distribution of water amongst the persons entitled thereto; (IV) to be present at the investigation of complaints by any canal officer or subordinate, and to give any information required in connection with irrigation.

It is now proposed that in addition they shall (V) distribute (parchas) to every riot, and (VI) report at the end of the *kharif* season personally to the canal officer as to the state of the crops in the lease; (VII) report to the Deputy Collector all mutations in holdings; (VIII) to assist the collecting department by pointing out the residences of the persons assessed and identifying them. The duties are responsible and involve a considerable amount of physical exertion. It is probable and desirable that in most cases a *lambardar* or *punchayet* will be appointed, but this will not diminish the amount of work to be jointly performed. It is absolutely necessary, in the irrigation season especially, that a *lambardar* shall devote a considerable amount of his time to his duties. He must be ready to trudge with the canal officers for several hours at a time in all weathers.

It is idle to expect that these duties will be performed by any one without remuneration—they are not the class of duties constituting an honourable burden for which remuneration is not found to be necessary, certainly not in this country.

On this point Mr. Mylne entirely agrees with Mr. Odling, and his opinion is particularly valuable, as the firm themselves discharge the duties of *lambardars* for a large part of their estate, employing paid servants whose wages it is understood the allowance received in the way of fees is not sufficient to cover. The Collector is also of opinion that remuneration must be given, and refers to the prevalence of party spirit and factious opposition which, it is believed, has interfered with the successful working of the *Ohowkidaree* Act.

As the *lambardars* will in future be to a certain extent responsible to the Collector, it will be desirable that a portion of the fees levied shall be paid by him, but the duties to be performed in connection therewith will require to be strictly limited. In particular they will have no concern with certificate cases. The total fees may in future be limited to three per cent., of which two per cent. will be payable by the canal officer and one per cent. by the Collector, fractions of annas being omitted in payments.

127. The only practicable way of creating the intermediary agency so strongly insisted on by the Committee appears to be to extend the system under which leases are at present granted on the joint applications of a contractor and cultivators. The contractor might be a *zemindar* or an association of three or four cultivators. It is essential that he shall have a beneficial interest in land included in the lease extending for its full term. The control of the outlet might ordinarily be made over to the contractor in these cases, and he might, if a resident *zemindar*, be himself allowed to prepare the demand statements for hot weather irrigation, in which case only is there an extra charge. The remuneration at present granted, 10 per cent., should not, however, be increased, unless the contractor is prepared to take the risks of bad debts, in which case 12½ per cent. might be allowed. In leases of this kind the approval of the Collector to the contractors would be requisite. Long leases on the application of the cultivators will continue to be granted; but in their case the *lambardar's* fees will be 5 per cent. only (on condition, of course, that it is earned), one per cent. of which will be paid by the collecting department and the remainder by the canal officer.

128. It is proposed to abolish putwaris' fees, but it may be necessary to call on these men to attend measurements or to attest the signatures to a lease, in which case they must be paid for the work done. A fee varying from 4 annas to 2 rupees, in accordance with the time taken up, will be authorized.

ADMINISTRATIVE CONTROL BY SUPERIOR OFFICERS.

129. It is not possible to permit appeals as a matter of right to the Superintending Engineer. He has many other duties besides the management of the Sone Canals, in which his position is purely that of a controlling officer. His duties are in no respect of an executive nature, and it is undesirable that he should be called on to give decisions in matters in which there is by law an appeal to the Collector. Mr. Inglis says:—

"I think it is worthy of consideration whether the Superintending Engineer should not be brought into more immediate contact with the revenue work of his subordinate officers."

It should certainly be expressly declared that the Superintending Engineer exercises full revisional powers, and that orders passed by any canal officer shall be modified as

accordance with his directions. He should be required to issue definite orders regarding the limits within which leases of various descriptions can be allowed, as the whole distribution of water from the canals must be arranged on one concerted system.

There are also matters which might usefully be referred to the Superintending Engineer by the Collector. It is indispensable (recommendation VIII of the Committee) that the selection of irrigable blocks to be let on lease shall rest with the canal officer. But it is not intended that this power shall be arbitrarily exercised. Leases cannot be granted in areas excluded by the Superintending Engineer; but outside these areas all persons complying with specified conditions have a moral if not a legal right to be supplied with water; in the case of an appeal to the Collector that officer should be entitled to call on the Superintending Engineer to give his written opinion as to whether the grounds of refusal were in his judgment sufficient. The same liberty should be given in the case of village channels, where the matter is usually decided on professional considerations.

130. Remissions on other than legal grounds are at present granted by Government on the application of the Superintending Engineer. In most cases it is of importance that if these remissions are granted at all they should be granted in time to prevent a demand actually being made. Whilst it is necessary that the orders of Government shall be obtained where public money of large amount is involved, the Superintending Engineer might be vested with powers to grant extraordinary remissions without previous reference to higher authority, provided (I) that the water-rates shall not be reduced below 10 annas per bigha, and (II) that the remissions on any one lease or for any single cause shall not exceed Rs. 500.

SUMMARY.

131. The chief recommendations made are summarized below—

I.—Five-year leases to be abolished, but to be replaced by leases for seven or three years, the former being sanctioned only where channels in really good order exist, the owners of which have been registered, and really suitable blocks can be obtained; the rate for these leases to be Rs. 1-4 per bigha, the present five-year lease rate. Where the channels, though not necessarily involving waste, are not altogether satisfactory, or the block is not so good as is desirable, the lease to be for three years only, and the charge to be raised to Rs. 1-9 per bigha.

II.—The lease to be in detail specifying all conditions, more especially regarding the outlets which the canal officer is not to be allowed to alter during the currency of the lease. The duty to be fixed as far as practicable on the results of past experience, the area under rice when the lease is entered on being mainly considered. Leases for seven years to be ordinarily refused for lands not previously irrigated, regarding which therefore data for fixing the discharge required is not available.

III.—Canal officers to be responsible for the supply of water through outlets, but to be allowed to delegate the custody of the outlet to *landholders*, who will be required to close the outlets when water to the full extent required has been supplied, or in accordance with orders given by proper authority.

IV.—The *tahil* to be limited to five days after ten days consecutive supply.

V.—The assessment of lands irrigated without authority in the *kharif* season shall be prohibi-

ed except with the previous sanction of the Collector, where a criminal offence has been committed and the offender cannot be covered.

VI.—The rates for *rabi* irrigation to be reduced to those for sugarcane modified.

VII.—No water to be supplied for *kharif* irrigation applications filed after the 1st of September except by volume, and in such cases half amount payable to be recovered in cash before water is supplied. The discharge of an outlet for a specified number of hours will be sold, and not a specified quantity of water.

VIII.—The length of village channels counting to a boundary of the lease to be in future limited to one mile, crossings to be provided at public expense, and existing village channels of more than one mile in length to be taken over and maintained in future by Government on certain conditions. The distance mentioned will be measured in a straight line.

IX.—In the case of assessments or remissions appeal to lie direct from orders passed by Sub-divisional Canal Officers to the Collector or to an officer exercising the powers of the Collector, who will be empowered to direct the Divisional Canal Officer to himself enquire and to report in the matter.

X.—The Superintending Engineer to be required to define the limits within which water is available for a) *kharif* irrigation on three or seven-year leases; b) *kharif* irrigation on annual leases; c) *rabi* irrigation at low rates; and d) hot weather irrigation. It is expressly declared that Canal Officers shall exercise all powers vested in them in subordination to the Superintending Engineer, and that they shall modify any order passed by them in accordance with his directions. Subject to the revisional jurisdiction noted above, no appeal to lie to the Superintending Engineer, but in any appeal to the Collector under section 91 regarding village channels or (d) the refusal of a Canal Officer to grant a permit on the ground of anticipated waste of water owing to the unsuitability of the block proposed, the Collector to be authorised to call on the Superintending Engineer for his written opinion, which shall form part of the records of the case.

XI.—Water to be sold for the supply of *ahars* from November to March only.

XII.—Joint and several liability to be abolished.

XIII.—Copies of the Revenue Report to be sent year to selected landholders, who will be asked to favour Government with any suggestions for improving the administration of the canals, and, if it is considered necessary, a conference will be held with the Superintending Engineer to discuss any possible improvements.

XIV.—In certain cases the Superintending Engineer with the concurrence of the Collector, to have power to cancel leases or prohibit permits being given to particular villages unless arrears of water-rates are discharged, or where water is persistently and habitually wasted or utilized for irrigating lands beyond the boundary of the lease.

RECOMMENDATIONS INVOLVING A CHANGE IN THE LAW.

132. The following provisions appear to be equitable, but legislation is necessary to admit of their being carried out.

I.—It is certainly only right that in the case of *bhaoli* tenures the landlord should in one form or other be made to pay a share of the water-rates. The recommendation (section 223 of the Committee's report) meets the case.

Volume I, page 70.

II.—It should be made clear that water-rate is an encumbrance on the land of the same nature as rent, and any tenant should be allowed to create this encumbrance. At present this point appears to be doubtful, there being a presumption only (capable of being rebutted) in its favour.

Section 76(e) of the Act.

III.—Where water has been misappropriated, and the Magistrate is unable to detect the offender, the persons benefited should be assessed by the Collector without reference to whether the water was obtained by cutting a village channel or a canal or distributary. This is not recommended by the majority of the Committee; but, as a matter of fact, it is almost impossible to secure a conviction, as proof of the actual perpetrator of the offence is seldom forthcoming.

Volume I, page 92.

Volume I, page 100.

IV.—Provision should be made as recommended by the Committee. "That application of cultivators representing an area of 85 per cent. of a block shall bind all the remaining cultivators of a block whether they assent or not."

V.—The users not owners of village channels should be registered. This course would avoid difficult legal question as to ownerships.

SENT OF RAI JAY PRONASH LALL BAHADUR, DATED 4TH APRIL 1888.

133. The dissent* commences by assuming that it has been proved that *ahara* irrigation is generally more beneficial than irrigation from the canals, that former methods of irrigation have been actively interfered with by the Canal Department, that drainage has been obstructed and the public health deteriorated by the canals, that the increased area under cultivation is doubtful, that benefit from sugar cultivation has not been proved, and that the canals are no appreciable help in time of scarcity. No special grounds beyond general references to the Committee's report are given for conclusions drawn, which have been dealt with *seriatim* in previous parts of the note, and will not be again referred to.

The experience of 1888, if the Rai Bahadur had chosen to visit the irrigated parts of the district, can scarcely fail to have convinced him of the benefit which the crops received from the canals in that year, and the experiments of Mr. H. Luson, C.E., and Messrs. Burrows, Thomson and Co., have at any rate set at rest any doubt that might be entertained as to the productive power of any kind of land well cultivated and sufficiently irrigated.

134. It is proposed by the Rai Bahadur, paragraph 46, that water shall be granted under the control of the Agricultural Department; paragraph 88, that no attempt shall be made to give water to defunct blocks, which is the key-note of Mr. H. Luson's proposals; paragraph 84, that no power shall be given to canal officers to restrict the supply, and paragraph 21, that *tail* shall be allowed. It is safe to say that under such conditions the value of the canals would approximate the Rai Bahadur's opinion of them. It would not be possible, where there was the least pressure, to get water more than 20 miles from the head, and it would be impossible for canal officers, or indeed any one, to give limits within which it would be safe to grant leases.

135. The rates suggested by the Committee are paragraph 37 of the dissent and sections 248 and 285† of the Committee's report distasteful, and paragraph 48 of the dissent, five-year leases are stated to be unpopular. Objection is also, paragraph 85, taken to the system of occasional waterings, and annual leases at a higher rate suggested. In this latter particular it has been found possible to conform to the wishes expressed, provided application is made by the 1st of September. The area under five-year lease has not diminished, and the ryots are stated by Mr. Luson to have shown, in 15 of the Dhomraon villages, their opinion of the value of the water by, the tenure being *bhaoli*, agreeing to pay the landlord's share of the rates as well as their own.

† Volume I, page 87.

136. An endeavour has been made to remove all well-grounded causes of complaint, but the canal officers must conform to physical conditions; they have water for sale available at certain times only, and under certain restrictions which are not arbitrarily imposed, but necessary to admit of the supply through the canals not being interfered with by accumulations of silt.

It has not in practice been found that these conditions clash with the requirements of agriculture (paragraph 37 of the dissent), and canal water has in fact during the last two years been eagerly availed of, the dissatisfied cultivators being those to whom it was on sufficient grounds found necessary to refuse leases.

PAMPHLET BY BABOO KANDHI SAHAI, B.A., B.L., ON CERTAIN ASPECTS OF THE SONS IRRIGATION QUESTION.

137. Baboo Kandhi Sahai, who, as Secretary to the Co-operating Committee referred to in section 4 of the report, gave valuable assistance in the enquiry, has written a pamphlet under the above title, of which I have received a copy, mainly with reference to the reports by Mr. Odling and Mr. Luson, published in the *Calcutta Gazette* for the 9th January and the 3rd of April 1889, referred to in paragraph 4 of this note.

138. The Committee are stated to have arrived at the following main conclusions:—

- "(a). That the canals are on the whole beneficial to the country, now that they have rendered it impossible to revert to the old system of *ahara* irrigation.
- "(b). That canal water is not beneficial to *rabi* or opium.
- "(c). That the *shudkar* system is the root of all evil, and that it should make way for a better system in which the chances and opportunities of doing evil might be minimised to the lowest degree.
- "(d). That the magisterial powers in the hands of Engineers had not worked well.
- "(e). That the collecting staff by its previous inaction and recent over-activity (put) gunpowder to the hidden flames."

and brought the feeling of soreness and exasperation to a climax.

Statement (a) has been fully dealt with in the earlier paragraphs of this note. Statement (b) is probably, except as regards wheat, so far true that crops irrigated by well water give better results, much better in the case of opium watered from old wells. Statement (c).—It is proposed to abolish the *shudkar* system in the *kharif* season, where it has led to evils, and to in its place substitute the system recommended in paragraph 85, under which—

"No water will be given, unless lease is executed beforehand, the tenants binding on the one hand to pay the water-rate, the Government binding itself on the other to supply the water timely."

As regards (d), the Committee's conclusions are not accurately stated. The Committee certainly on general principles recommend, section 169, the withdrawal of the magisterial powers, but they expressly state that they—

"notice the sparing manner in which these powers have been exercised, and we have no reason to doubt that, as a general rule, they have been exercised in the past with discretion."

Volume I, page 92.

The recommendation is in no way based on whether the powers had worked well or otherwise (c). The recovery of arrears was doubtless unpopular with the assesses, who had hoped to escape payment, but, as has been stated in the commencement of the note, the agitation was one of the results of the introduction of irrigation, without rules found by experience to be suited to the district.

It is stated that—

"Many other points have been found to which it is not necessary to refer to at present."

They are incidentally adverted to throughout the pamphlet, which it is right to say is obviously animated by a desire to improve the irrigation administration by suggestions offered in a spirit regarding which complaint cannot be made.

139. The main object of the pamphlet is, however, to show that the rates at present charged for water are unjustifiable. Paragraph 7 runs as follows:—

"Such is the summary of the recommendations of the Commission I shall begin with the last, for the lowering of rates, first, as being the most important, and without which, in the words of the Commission, no improvement will be accepted as an adequate outcome of the results of the Commission."

It is perhaps desirable that the arguments adduced in support of this contention shall be specially noticed; the other points have been fully commented on in previous pages of this note. Whilst the accuracy of the crop experiments which were carried out is not questioned, it is stated that the results are not such as would ordinarily be obtained—

"In ordinary course of business all the fields are not reaped at once, and generally a great amount is wasted in reaping, in threshing, in winnowing, before the grain is actually stored."

This loss is stated to reduce the yield to $\frac{3}{4}$ ths of that estimated, and it is contended that Mr. Lusson's figures—

"should be reduced not only by what is called the co-efficient of shrinkage, but also by the co-efficient of wastage."

The objections raised are entirely met, as will be seen from the quotation below, in the experiments carried out by Messrs. Burrows, Thomson and Mylne, which gave an average outturn of 31 maunds 5 seers per bigah on grain weighed on the threshing floor at a distance from the field—

"The results obtained from the different sources are nearly identical. The figures of Messrs. Burrows, Thomson and Mylne are slightly lower than the rest, because a certain amount of wastage occurred from the method they adopted of drying the crop. They had it tied up in bundles and carried to head-quarters, so that some grain must have fallen out on the way. The wastage, however, would not be much greater than occurs usually when the cultivators carry the bundles from the fields. In my experiments there was absolutely no wastage, because as soon as it was cut the crop was sown up in bags, which were afterwards opened only in my presence. Similarly in weighing wet crops upon the ground the canal officers would not make any waste."

In these experiments this particular source of error was certainly eliminated.

140. Further on in paragraph 9 it is suggested that it may be intended to infer that the average produce is 31 maunds an acre. Such is not the case; the above was the average of experiments on good crops; the average on the whole irrigated area for 1885 is $18\frac{7}{10}$ maunds per acre. The average of 1,227 experiments made by canal officers to date on average crops is $16\frac{3}{4}$ maunds, and it is contended that Mr. Lusson's experiments go far to show that these were substantially accurate.

141. A number of calculations on the profits of cultivators, which afford no real information, are given, and it is then asked:—

"Is there any marked improvement in the export or import of the country? Is there any change in the condition of the people of canal tracts as distinct from non-irrigated tracts? These are questions which do admit of no equivocal answers. If we compare the export and the import of recent years with ten years back, we will find that increase in these items is not at all distinct from the general increase, which of course is due to the improvement of the yet undeveloped resources of the country."

"The export and import of a country have been truly regarded as the index of a country's material prosperity. If we would like to know whether a country has improved in its material wealth, we should examine whether the import or the export has increased. One of the chief articles of import in this country is European piece-goods. With the spread of English education, and a desire to copy the Western ways of living in matters of convenience and comfort, it is expected that the import of such goods would increase even if the country did not improve in wealth. There is yet another fact which always tends to increase the consumption of the articles of import. The population is an increasing quantity which is attended with an increase in the value of imported articles in proportion to the increase in the number of population. In this view of the case we would expect that the import of the district would show an increase in 1888 or that of 1874 in proportion to the two causes above referred to. Now I would compare the value of the European piece-goods imported into the district in the year 1874, when the canals had no existence, with that imported in the year 1888, when they were placed in a fair working order, and would prove that instead of showing an improvement in the material condition of the people, as one would expect, if the canals were so beneficial to the country as we are led to believe, it shows a deterioration. If the contention of the other side were correct, we should have found an increase in the value of the imports more than what could be referred to the two causes above mentioned. In the year 1874 during the first four months the value of the European piece-goods imported from Howrah was £122,568 (Statistical Report, Shahabad, page 289), but in the interval, i.e., from 1874 to 1888, the population increased from 17 to 19 lakhs; hence the import should have increased in the proportion of 19 to 17, assuming every other circumstance to be the same—that is the value of the import which we would expect in 1888 is £140,441. If we now take into account the other cause of increase, which is an indeterminate quantity, the value of imported article would be more than the sum above given. But what do we actually find the value of European piece-goods imported in the district to be in the first four months of 1888? It is not more than Rs. 18,16,410, which is equivalent to £100,000 at the present exchange rate (see for the value of the import, Calcutta Gazette Supplement, pages 721, 900, 1280, 1586, of 1888). Thus the consumption of the European piece-goods now is not what it was in 1874."

142. The Statistical Department of this Government has furnished the subjoined statement which gives the particulars relied on by Baboo Kanhaji Sahai, not for four months, but for 13 years:—

Statement showing the Imports into the Shahabad district from Calcutta of piece-goods, European, during the years from 1876-77 to 1888-89.

YEAR.	Quantity.	Rate per maund.	Value.
	Mds.	Rs.	Rs.
1876-77	25,004	80	20,00,320
1877-78	31,198	80	24,95,840
1878-79	37,565	80	30,05,200
1879-80	39,125	75	29,34,375
1880-81	40,493	75	30,37,025
1881-82	46,101	75	34,57,575
1882-83	43,345	75	32,50,875
1883-84	46,537	72	33,50,664
1884-85	42,084	72	30,30,048
1885-86	55,142	63	34,73,206
1886-87	70,003	63	44,10,189
1887-88	56,136	63	35,36,568
1888-89	60,924	63	38,38,312

The Statistical Department states that figures previous to 1876-77 are not available, but those given do not appear to bear out the contention that the import of piece-goods has not increased, and the assertion that—

"In the face of this fact the friends of the canals have no case, nor can they ever justify its case right to exist on its own merits."

is not altogether in keeping with the facts. The statement that—

"Care has been taken always to allow the errors to be in favour of the canal"

appears, under the circumstances, to be of more than doubtful accuracy.

Another consideration is put forward, which is, more favourable years, which are by God's grace more than unfavourable, the canal water is either not at all required, or required as a luxury. It is only at long intervals that a season recurs."

Therefore it is useless to lay much stress upon the failure of the water when it is known that the *Chitra* came opportunely to the place of the *Hastha*."

Of 19 years in nine there was less than one inch of fall in the first twenty days of October, which covers the greater part of both the *Hatiya* and *Chitra*.

The arrangements during 1888 appear to have met general approval, except from one point of view, regarding which the following remarks are made:—

A system works well or badly according as the person in charge is good or bad, the system is imperfect. But if the system change with change of hands, the system is a model of perfection. Viewed in this light, the present system stands condemned. It is almost admitted that in the year under review the authorities have worked better in all the departments than in previous years. The supply of water was satisfactory, the prayers of cultivators were attended to, and generally speaking the arrangements were good. It may be asked how is it that it was not successful in previous years. The recent agitation may be said to have produced this salutary effect. But when things can be managed better according to the will of the officer, which may be forced or interested, they must be placed on a better footing. In fact the successful management of this year carries with it the condemnation of the system. The proposed scheme differs from the existing, in that it offers the least opportunity for the rule of individual idiosyncracies."

Reference is made by the writer to the falling off in five-tilles in the Buxar Division, whilst those in the Arrah and Eastern Sone Divisions were mostly renewed. The report in the Buxar Division have this year largely increased, the report shows clearly that there were special difficulties in Bhojapore, due partly to the area of land held by and partly to the cultivators being to a large extent Brahmins or Brahmans. But the experience of one year has been sufficient to overcome even their reluctance to pay rates.

GENERAL REMARKS.

On one point I quite agree with both Rai Jai Lal Bahadur and Baboo Kandjhi Sahai, and that is, as recently stated in the Superintending Engineer's Report for 1888-89:—

"It is fully recognised that lasting contentment can only result by irrigating cultivators full crops, and that anything short of a standard will whatever may be the measure of the benefits compared with the water-rates paid, lead to complaints, though ill-founded, are to be avoided."

The system now proposed will, I believe, secure this end in the largest degree possible.

146. In the report the Committee acknowledge the services of various officials and gentlemen, foremost amongst whom is Mr. L. Mylne of the firm of Messrs. Burrows, Thomson and Mylne. To the gentlemen comprising this firm the thanks of Government are due, not only for services rendered in the course of this enquiry, which were important, but for a long course of assistance to the Irrigation Department, which has been more than once cordially and fully acknowledged both by Government and by the local Head of the Department, the Superintending Engineer. The suggestions they have made have always been deserving of the most attentive consideration as based on reliable data, and having in view the equitable treatment of both the cultivator and the canal officers.

The name of Baboo Kandhji Sahai is amongst those mentioned; his efforts to put the popular side of the question before Government and the Committee in a fair and becoming manner deserves recognition. The Committee specially acknowledge the assistance received from Mr. W. A. Inglis, Executive Engineer, and Baboo Saroda Pershad Chatterjee, Deputy Collector.

147. Mr. Luson's report on the subjects into which he was directed to enquire is very full and complete. It would not have been possible to deal with these subjects with anything approaching to the same certainty in the absence of the very valuable information collected by him. Mr. Luson has thoroughly earned the commendation of Government.

148. Mr. Cotton, the President of the Committee, brings to notice the assistance rendered by the Maharajah of Doonraon and his Dewan Rai Jai Prakash Lal Bahadur, who was one of the members. It would have been difficult to have obtained the facilities necessary for the meetings without the assistance of the Maharajah, who declined to receive even a reimbursement of the actual expenses incurred. Mr. Cotton also mentions the candour and moderation displayed by Mr. Odling, from whom I have received material assistance in preparing this note.

149. The report of the Committee is in point of clearness and desire to introduce improvements all that could be wished. Alterations in the system in force, all in the direction pointed out by Mr. Cotton, have led to a considerable departure from the recommendations made by the Committee of which he was President; but none the less does he deserve the acknowledgments of Government for the valuable services he has rendered in the enquiry.

C. W. I. HARRISON, *Lieut.-Col., R.E.*

Chief Engineer, Bengal.

APPENDIX I TO NOTR. DATED THE 14TH OF JANUARY 1890, BY COLONEL C. W. I. HARRISON, R.E., CHIEF ENGINEER, BENGAL, ON THE REPORT OF THE COMMITTEE APPOINTED TO ENQUIRE INTO THE ADMINISTRATION OF THE SONE CANALS.

Note by C. W. ODLING, Esq., Superintending Engineer, Sone Circle, on Drainage Works carried out and still required in connection with the Sone Canals, dated the 14th January 1890.

In sections 45 to 65 of the Report of the Committee appointed to enquire into the administration of the Sone Canals, the complaints regarding obstruction to drainage occasioned by the canal are adverted to. It is stated that much has already been done, but that much remains to be taken up. The necessity for care and caution is admitted, but the paramount importance of the subject is urged as a reason for continuing to pay the utmost attention to it.

2. Since the Committee sat, the matter has continued to receive the fullest attention. There was an unusually heavy fall of rain in August 1888, and data have been obtained which has admitted of a large number of projects being sanctioned after full and thorough investigations based on reliable observations.

A list of drainage works sanctioned from 1884-85 to 1888-89 is given at pages 124-125 of Vol. I of the Committee's Report. Works estimated to cost Rs. 1,61,861 have since been sanctioned, and a complete list of these, as well as of those shown in the report, is appended to this note. Material progress, it can scarcely be denied, has been made.

3. The statement following gives particulars regarding the heavy fall of rain mentioned in the preceding paragraph.

Statement of rainfall for the period 26th to 29th August 1888.

STATIONS.		MONTH AND DATE.				
		26th August 1888.	27th August 1888.	28th August 1888.	29th August 1888.	Total.
<i>Eastern Sone Division.</i>		Inches.	Inches.	Inches.	Inches.	Inches.
Banhipore	...	2.50	2.91	0.25	0.00	4.66
Bikram	...	2.20	6.35	0.50	0.00	8.95
Daudnagar	...	1.70	5.85	1.75	0.00	9.30
Average		2.13	5.00	0.83	0.00	7.96
<i>Buxar Division.</i>						
Buxar	...	0.00	5.60	4.00	0.25	9.85
Bikroul	...	2.30	7.05	1.20	0.40	10.95
Jumrore	...	0.00	4.15	2.41	0.20	6.76
Hasawan	...	0.00	4.07	1.27	1.41	6.45
Average		0.57	5.23	2.22	0.40	8.50
<i>Arrah Division.</i>						
Arrah	...	0.04	7.70	2.27	0.00	10.01
Agesson	...	2.75	8.30	0.50	0.00	11.55
Nasirgunj	...	1.25	5.01	1.85	0.00	8.11
Ramnagar	...	0.58	6.80	2.90	0.60	10.88
Koath	...	0.00	9.00	0.60	0.00	9.60
Average		0.93	7.38	1.62	0.12	10.05
Sone Circle average of 12 stations		1.11	6.07	1.62	0.21	9.01

The average fall at all stations on the 27th of August exceeded six inches, followed by upwards of one inch and a half on the following day, so that the opportunities for observation were very favourable, and they were taken advantage of.

4. In the following statements all cases where drainage was found to be obstructed are mentioned, the action taken to remedy it being also noted:—

Eastern Sone Division.

LOCALITY.	Nature of obstruction.	Size of cut or breach.	Action taken.
Patna Canal, 9½ mile ...	Water impounded against canal bank.	Nil ...	The existing drainage cut has been extended.
Ditto, 16th mile ...	Ditto ...	Nil ...	Drainage channel provided in sanctioned estimate for extending Weir II, Patna Canal.
Ditto, 16½ ..	Ditto ...	6' wide ...	Culvert built.
Ditto, 20th ..	Ditto ...	Nil ...	Pipes 12" in diameter fixed.
Ditto, 11th ...	Ditto ...	Nil ...	Two pipes fixed, 50 bigahs only affected.
Mali Distributary, 7th mile ...	Ditto ...	Nil ...	Estimate for works required nearly completed.
Khojassa Distributary, 22nd mile.	Ditto ...	Nil ...	Estimate for syphon under preparation. Drainage area ½ square mile.
Khojassa Distributary, 24th mile.	Ditto ..	6' wide ...	Estimate for syphon under preparation. Drainage area ½ square mile.
Emamgunj Distributary, 2nd mile.	Ditto, but to a very limited extent.	Nil ...	Inlet estimate being prepared.
Emamgunj Distributary, 5th mile.	Ditto ...	Nil ...	Two pipes fixed. Drainage area 1 square mile.
Emamgunj Distributary, 20th mile.	Drainage water impounded.	Nil ...	Estimate for syphon sanctioned.
Daus Distributary ...	Ditto ...	Nil ...	Two pipes fixed. A syphon will be provided.
Shamshernagar escape ...	Ditto ...	Nil ...	Two culverts sanctioned.

Arrah Division.

LOCALITY.	Nature of obstruction.	Size of cut or breach.	Action taken.
Arrah Canal, 24th to 25th mile	Drainage water impounded.	Nil ...	Existing drainage cut cleared and out-fall improved.
Rajpore Distributary, 2nd ..	Ditto ...	2' ...	A small drainage cut made.
Rajpore Distributary, 7th ..	Ditto ...	Nil ...	Ditto ditto.
Mongrowlia Distributary ...	Ditto ...	Nil ...	Under consideration.
Mouna Distributary ...	Ditto ...	4' ...	Temporary inlet provided and small drainage cut.
Doomraon Canal, 7th mile ...	Ditto ...	17' ...	Two syphons have been constructed and an inlet and drainage cut are in progress.
Doomraon Canal, 9th ..	Ditto ...	17' ...	
Doomraon Canal, 17th ..	Ditto ...	12' ...	
Sukunee Distributary ...	Ditto ...	20' ...	Estimate under preparation. Apparently an accident, not the result of obstructed drainage.
Arrah Canal, parallel channel, 36th mile.	Ditto ...	9' ...	The Chouvi drainage cut under construction provides for the drainage of this part of the country.
Panmaree Distributary, 5th mile.	Ditto ...	10' ...	
Panmaree Distributary, 6th mile.	Ditto ...	32' ...	
Panmaree Escape, 7th mile ...	Ditto ...	15' ...	Plans for remodelling this work are under preparation.
Billia Distributary, 1st mile ...	Ditto ...	5' ...	Drainage culvert built.
Billia Distributary, 4th ..	Ditto ...	8' ...	Apparently an accident; drainage not obstructed.
Jypore Distributary, 1st mile	Ditto ...	6' ...	Estimate for drainage cut being prepared.
Jypore Distributary, 5th ..	Ditto ...	13' ...	Caused by village channels belonging to private owners; under consideration.
Arrah Canal, parallel channel, 43rd mile.	Ditto ...	5' ...	The breaches were cuts made by villagers. Obstruction doubtful.
Arrah Canal, parallel channel, 45th mile.	Ditto ...	6' ...	
Arrah Canal, parallel channel, 48th mile.	Ditto ...	18' ...	Inlet built.
Asni Distributary, 1st mile ...	Ditto ...	10' ...	Under consideration.
Koolwar Distributary, 14th mile	Ditto ...	Nil ...	Syphons being constructed.
Ekwari Distributary ...	Ditto ...	Nil ...	

LOCALITY.	Nature of obstruction.	Size of cut or breach.	Action taken.
Behesa Branch Canal, 12th mile and parallel channel.	Flood water from Sydha syphon impounded.	25'	Under consideration. A proper outfall from the Sydha syphon is required, but there are many difficulties, as the natural drainage is intersected by <i>adars</i> ; an inlet into the canal for from 100 to 150 cubic feet per second is admissible.
Behesa Branch Canal, 13th mile	Flood water impounded.	12'	
Kuteya Distributary, 1st mile	Breached from canal.	25'	Caused by escape of water from canal.
Kuteya Distributary, 3rd mile	Water impounded against bank.	20'	Under consideration; outfall for discharge through syphons under Gudhani Distributary required. The necessary survey has been made and levels taken.
Kuteya Distributary, 4th mile	Ditto	10'	
Kuteya Distributary, 6th mile	Ditto	10'	Existing syphons apparently sufficient, but outfalls, as mentioned above required.
Gudhani Distributary, 2nd mile	Ditto	6'	
Gudhani Distributary, 3rd mile	Ditto	14'	Not yet taken up.
Gudhani Distributary, 4th mile	Ditto	16'	
Gudhani Distributary, 5th mile	Ditto	6'	Syphons under construction.
Naranpore Distributary, 4th mile	Ditto	5'	
Naranpore Distributary, 3rd mile	Ditto	10'	Ditto ditto.
Gyanpore Distributary, 3rd mile	Ditto	5'	
Gyanpore Distributary, 4th mile	Ditto	6'	Inlets will be arranged for; possibly cuts on the bank will suffice.
Kuteya Factory Distributary, 1st mile.	Ditto	19'	
Kuteya Factory Distributary, 2nd mile.	Ditto	14'	
Bachiro Drainage Cut, 4th mile	Ditto	25'	
Bachiro Drainage Cut, 5th mile	Ditto	25'	

Roxar Division.

LOCALITY.	Nature of obstruction.	Size of cut or breach.	Action taken.
Bhojapore Distributary, 3rd mile.	Drainage water impounded.	15'	A drainage cut of some magnitude required. Project approved by Chief Engineer; detailed estimate under preparation.
Saiyoneo Distributary, 4th mile.	Ditto	6'	
Gurrah Distributary, 2nd mile	Ditto	10'	Drainage water for the present passed down side cuttings. Under consideration.
Salya Distributary, 3rd mile	Ditto	6'	Small syphon required; estimate under preparation.
Chousa Canal, 11th to 17th mile	Ditto	Nil	Area affected small; all waste land.
Kochus Distributary, 1st mile	Ditto	Nil	Drainage cut sanctioned; work commenced. Existing drainage cut will be improved. Funds available on sanctioned estimate.
Kochus Distributary, 8th mile	Doubtful	19'	It is stated that drainage is not impounded, but that breaches are due to nature of soil. Under enquiry.
Kochus Distributary, 9th mile	Ditto	15'	
Kochus Distributary, 11th mile	Ditto	15'	Syphon under construction.
Kurbani Distributary, 1st mile	Drainage water impounded.	4'	
Khurghun Distributary, 1st mile.	Ditto	Not given	Under investigation.
Khurghun Distributary, 4th mile.	Ditto	Ditto	Extra opening in syphon being provided.

5. It will be noticed that in the majority of the cases mentioned, steps have actually been taken by which whatever obstruction existed has been remedied. It is only in years when there is an exceptionally heavy fall of rain in a limited time that minor obstructions become apparent, and any delay in carrying out the necessary work is due to this cause. The major works, such as the Chousa catch drain, estimated cost Rs. 57,448, the Doomraon drainage cut, estimated cost Rs. 18,201, and the Chowri drainage, estimated cost Rs. 22,412, have been the subject of prolonged investigations, and the exact plans adopted have been only settled after several discussions with the Chief Engineer, and the most careful consideration of all the interests involved.

6. The large works still required are those in connection with the Kuntia Distributary, miles 1 to 5, the Burhowlie and Tar Distributaries, the Doomraon Canal, 18th mile, and the Bhojapore Distributary, 3rd mile. The main features of the plans for the latter work have been approved of by the Chief Engineer, and surveys and investigations regarding the remaining three are in progress.

C. W. ODLING,
Superintending Engineer, Sonc Circle.

List of Drainage and Protective Works sanctioned since 1884-85.

EASTERN MAIN CANAL SERIES.

PARTICULARS.	Authority.	Amount of estimate.	Total.	REMARKS.
1884-85.		Rs.	Rs.	
Estimate for a siphon under the head Khojasa distributary at 26th mile, 3,760 feet.	Superintending Engineer's No. 360, dated 24th January 1885.	344		
Estimate for two lines of Ranoganj pipes under the Khojasa distributary at 25th mile, 4,743 feet.	Ditto ditto	199		
			533	
1885-86.				
Estimate for an aqueduct overfall on drainage cut at the 43rd mile of the Patna canal.	Superintending Engineer's No. 2697, dated 3rd July 1885.	87		
Estimate for Balar drainage cut	Superintending Engineer's No. 450, dated 13th February 1886.	715		
Estimate for a siphon to pass water from the Poonpoo river under the Futtchpore distributary.	Superintending Engineer's No. 1020, dated 25th March 1886.	395		
			1,197	
1888-89.				
Estimate for an escape from Rowa distributary, Patna canal.	Bengal Government No. 872-I., dated 18th May 1888.	5,362		Chargable to distributaries.
Estimate for a drainage inlet into the Patna canal at 16½ miles, on the left bank.	Superintending Engineer's No. 130, dated 8th January 1889.	271		
			5,633	
1889-90.				
Estimate for raising right bank of the Manora distributary and protecting the village Kharati by an embankment.	Bengal Government No. 918-I., dated 20th June 1889.	7,862		Ditto ditto.
Estimate for a siphon at 20½ mile of the Khojasa distributary, Patna canal.	Superintending Engineer's No. 8467, dated 6th August 1889.	218		Ditto ditto.
Estimate for protecting embankments round certain villages between the Poonpoo river and Futtchpore distributary.	Bengal Government No. 93-I., dated 20th June 1889.	4,494		
Estimate for two masonry inlets for drainage at 0 mile, 600 feet, of Shamsheeruggur escape, 24th mile, Patna canal.	Bengal Government No. 1487-I.A., dated 11th October 1889.	436		
Constructing a siphon for drainage at the 19½ mile of the Emamganj distributary.	Submitted to Chief Engineer, No. 4852, dated 25th November 1889.	1,602		Ditto ditto.
			14,632	
			21,095	

C. W. ODLING,

Superintending Engineer, Sone Circle.

List of Drainage and Protective Works sanctioned since 1884-85.

WESTERN MAIN CANAL SERIES.

PARTICULARS.	Authority.	Amount of estimate.	Total.	REMARKS.
1884-85.		Rs.	Rs.	
Estimate for the preliminary operations in the Loharabad (Poero drainage cut), Sebooa branch canal.	Bengal Government No. 5877, dated 28th November 1884.	472		
Estimate for constructing an escape to the right parallel channel by the inlet into the Raghunathpore distributary (Doomraon branch canal).	Superintending Engineer's No. 4618, dated 1st September 1884.	413		
Estimate for constructing a culvert over drainage cut No. 5, opposite fall No. V, Doomraon branch canal.	Superintending Engineer's No. 98, dated 8th January 1885.	301		
Estimate for constructing a culvert over the road opposite the Raghunathpore bungalow (Doomraon branch canal).	Superintending Engineer's No. 651, dated 11th February 1885.	240		
Estimate for constructing a drainage culvert under Panmaroo distributary escape channel (Arrah canal).	Superintending Engineer's No. 1200, dated 19th March 1885.	849		
	Carried over	2,275		

PARTICULARS.	Authority.	Amount of estimate.	Total.	REMARKS.
		Rs.	Rs.	
1884-85—concluded.	Brought forward ...	2,275		
Estimate for drainage cut from the Raipore village to the Dunwar escape (Arrah canal).	Superintending Engineer's No. 1463, dated 31st March 1885.	313		
Estimate for an escape channel from the Nodhulah distributary (Buxar Division).	Bengal Government No. 1685—L., dated 24th October 1884.	2,059		
Estimate for drainage for the Buxar Railway station (Buxar Division).	Superintending Engineer's No. 1021, dated 10th November 1884.	956		
Estimate for constructing an escape channel from Khairabad distributary, Main Western Canal (Buxar Division).	Bengal Government No. 314—L., dated 28th February 1885.	3,124		
Estimate for extra land required to be taken up for terminal portion of the escape to the Buxar Jall water-supply channel (Buxar canal).	Bengal Government No. 469—L., dated 14th March 1885.	122		
Estimate for constructing an escape channel from Gurra (Howbey) (Buxar canal).	Bengal Government No. 523—L., dated 23rd March 1885.	7,494		
Estimate for an inlet at 12th mile, 20 chains, Doornan branch canal.	Superintending Engineer's No. 4425, dated 21st August 1884.	334		Chargeable to distributaries.
1885-86.			17,269	
Estimate for an escape channel from the Panjraon distributary, Gurra Chowbey branch canal.	Bengal Government No. 13—T., dated 24th April 1885.	4,429		
Estimate for a drainage cut along the Koor-moor distributary from 5th mile, 1,700 feet, to 5th mile, 1,700 feet (Behosa branch canal).	Superintending Engineer's No. 2188 dated 26th May 1885.	149		
Estimate for a syphon under the Behosa branch canal at 12th mile, 2,220 feet.	Superintending Engineer's No. 2182, dated 26th May 1885.	1,360		
Estimate for constructing an escape channel from the Huthory distributary, Main Western Canal (Buxar Division).	Bengal Government No. 779—L., dated 25th June 1885.	6,103		
Estimate for constructing drainage culverts in the Jamun sub-division, Chowra canal (Buxar Division).	Superintending Engineer's No. 2746, dated 6th July 1885.	1,762		
Estimate for constructing an escape channel from the Karghar distributary, Gurra Chowbey branch canal.	Bengal Government No. 874—L., dated 21st July 1885.	6,019		
Estimate for a syphon at 3rd mile, 2,000 feet, of the Goeapure sub-distributary, Behosa branch canal.	Superintending Engineer's No. 2904, dated 21st July 1886.	161		
Estimate for the proposed extension to the Becharoo drainage cut, Behosa branch canal.	Bengal Government No. 96—L., dated 16th January 1886.	57,678		
Estimate for a syphon under the Unwas distributary which takes off from the Chowra branch canal of the Buxar canal system.	Superintending Engineer's No. 257, dated 22nd January 1886.	1,045		
Constructing an escape channel from the Gurra sub-distributary (Buxar canal).	Bengal Government No. 162—L., dated 23rd January 1886.	2,339		Ditto ditto.
Escape south distributary (Buxar) ...	Bengal Government No. 459—L., dated 11th March 1886.	2,008		Ditto ditto.
Escape from Amarpur sub-distributary (Buxar canal).	Bengal Government No. 406—L., dated 12th March 1886.	2,958		Ditto ditto.
1886-87.			83,099	
Estimate for a syphon under the Beasnee sub-distributary at 24th mile, Arrah canal.	Superintending Engineer's No. 1143, dated 5th April 1886.	1,396		
Estimate for a culvert over drainage cut No. 4, Doornan branch canal.	Superintending Engineer's No. 1179, dated 7th April 1886.	171		
Estimate for a syphon and drainage cut at 1st mile, 765 feet, and bridge at 1st mile, 5,080 feet, on Gadhani sub-distributary, Behosa branch canal.	Bengal Government No. 68—T., dated 13th May 1886.	4,892		
Estimate for a drainage channel at Chandee on the 15th mile, Buxar canal.	Superintending Engineer's No. 2—011, dated 10th June 1886.	1,398		
Amount expended on the drainage cut, Wana distributary.	Bengal Government No. 1466—L.A., dated 30th September 1886.	128		
Estimate for a bridge over the Jamorhi extended drainage cut at 3rd mile, 51 chains.	Bengal Government No. 406—L., dated 10th March 1887.	556		
Syphon culvert under the Behosa branch canal, 2nd mile, 3,250 feet.	Bengal Government No. 216—L., dated 5th February 1887.	5,272		Ditto ditto.
1887-88.			13,512	
Estimate for constructing nine drainage culverts in the Jamun sub-division (Chowra).	Bengal Government No. 606—L., dated 16th April 1887.	2,160		Ditto ditto.
Estimate for a drainage culvert under the Koor-moor distributary at 9th mile 2,295 feet.	Bengal Government No. 1146—T.L., dated 16th July 1887.	2,096		
Carried over ...		4,254		

PARTICULARS.	Authority.	Amount estimate.	Total.	REMARKS.
1887-88—concluded.	Brought forward	Rs. 4,245	Pice 100	
Providing the Bhojapore distributary with an escape at 22½ mile.	Bengal Government No. 1004— I., dated 10th December 1887.	2,075		Chargeable to distribu- taries.
Constructing a syphon culvert with outfall drain at 10½ mile, Doomraon branch canal.	Bengal Government No. 200 I., dated 10th February 1888.	3,342		Chargeable to reserve for general purposes.
1888-89.			9,671	
Estimate for drainage culvert under Pannuri distributary.	Bengal Government No. 580— I., dated 18th May 1888.	693		Chargeable to distribu- taries.
Constructing a weir in the Bhoita share	Bengal Government No. 1081— I., dated 22nd June 1888.	2,127		
Estimate for a drainage cut required at the 6th mile of the Rajpore distributary (Arrah Division).	Bengal Government No. 1,03— I., dated 12th July 1888.	505		Ditto ditto.
Estimate for drainage culvert required to be constructed in connection with the Dillu distributary.	Bengal Government No. 120— I., dated 23rd January 1889.	541		Ditto ditto.
Estimate for constructing the Chowari drain- age cut	Bengal Government No. 472— I., dated 20th March 1889.	22,412	20,268	
1889-90.				
Estimate for land required to be taken up for repairing banks of the Kuntaya escape channel.	Bengal Government No. 600— I., dated 22nd April 1889.	282		
Estimate for drainage works required in connection with the Chowari canal distributaries.	Bengal Government No. 618— I.A., dated 23rd April 1889.	1,020		Ditto ditto.
Estimate for drainage works required in connection with the Chowari canal.	Ditto ditto	425		Chargeable to reserve for general purposes.
Constructing a syphon at 6th mile, 21 chains, Doomraon branch canal.	Bengal Government No. 647— I., dated 20th April 1889.	5,708		Chargeable to distribu- taries.
Constructing syphon at 4th mile, Kurlasi distributary, from the Chowari branch canal.	Bengal Government No. 748— I.A., dated 10th May 1889.	1,231		Ditto ditto.
Constructing a drainage cut in village Bihita in the Arrah canal.	Bengal Government No. 776— I.A., dated 21st May 1889.	651		
Constructing an escape channel from the Rajpore distributary.	Bengal Government No. 1072— I.A., dated 21st June 1889.	855		Ditto ditto.
Constructing an inlet and escape for the left parallel channel, Arrah canal, at 50th mile, 20 chains.	Bengal Government No. 1110— I.A., dated 20th July 1889.	760		Ditto ditto.
Constructing a syphon culvert for drainage under the Gouapore distributary, 1st mile, 88 chains.	Bengal Government No. 1,116— I.A., dated 20th July 1889.	671		Ditto ditto.
Constructing a syphon at 0 mile, 32 chains under the Kuntaya Factory sub-distributary in the Arrah Division.	Bengal Government No. 1134— I.A., dated 23rd July 1889.	391		Ditto ditto.
Constructing an escape on the right bank of the Chowari canal at 10th mile, 3,000 feet.	Bengal Government No. 1318— I.A., dated 1st August 1889.	1,851		Chargeable to reserve for general purposes.
Constructing an escape channel at the 8th mile, 5,122 feet, of the Kuntaya distributary.	Bengal Government No. 1477— I., dated 25th September 1889.	9,705		Chargeable to distribu- taries.
Constructing two syphon culverts under the Elwary distributaries at 2nd mile, 38 chains, and 42nd mile, 21½ chains.	Submitted to Chief Engineer, No. 4093, dated 4th November 1889.	1,550		Ditto ditto.
Constructing the Chowari catch-drain	Submitted to Chief Engineer, No. 4551, dated 24th November 1889.	57,448		Since sanctioned.
Constructing drainage cuts at the 7th and 8 miles, Doomraon branch canal.	Submitted to Chief Engineer, No. 4696, dated 27th November 1889.	16,201		Ditto ditto.
Constructing a bridge over the Kythoo drain- age cut at 1st mile, 12 chains.	Superintending Engineer's No. 5380, dated 17th December 1889.	792		Chargeable to drainage and protective works.
Constructing a bridge at 9½ mile of the Dun- war escape channel.	Bengal Government No. 41, dated 2nd January 1890.	3,875		Ditto ditto.
			1,05,657	
			2,00,276	

C. W. OBLING,

Superintending Engineer, Sone Circle.

The 11th January 1890.

No 37Mne., dated Calcutta, the 10th February 1890.

The following report of the 11th quarterly inspection of the Dock Works at Kidderpore, which are being carried out by the Commissioners for making improvements in the Port of Calcutta, is published for general information.

By order of the Lieutenant-Governor of Bengal,

W. B. BESTIC,

Under Secy. to the Govt. of Bengal, P. W. Dept.

QUARTERLY INSPECTION OF THE KIDDERPORE DOCK WORKS.

No 963, dated Calcutta, the 6th-7th February 1890.

From—H. JOIL, Esq., and W. CONNAN, Esq.,

To—The Secretary to the Government of Bengal, Public Works Dept.

In accordance with the order of the Government of Bengal, memorandum No. 110 (Marine) of the 27th ultimo, we have the honour to report that the 11th quarterly inspection of the Kidderpore Dock Works was made on the 5th instant.

2. The usual tabular statement and the index plan showing the work done during the quarter ending 31st December 1889, and the total amount executed from the commencement, which have been prepared by the Superintending Engineer of the Dock Works, are already with Government.

3. The progress during the quarter is under-noted.

PERMANENT WORKS.

Sixty feet Lock.—The work is nearly completed, and only 6·8 per cent. of the masonry now remains to be done, 195,000 cubic feet of masonry having been built during the quarter.

Eighty feet Entrance.—Completed nearly up to coping level. 74,792 cubic feet of masonry was built during the quarter, 10·7 per cent. only remaining to be done.

Double Entrance to Dock No. 1.—The erection of the gates was commenced and 233,800 cubic feet masonry built during the quarter, only 13 per cent. remaining to be done.

Tidal Basin.—The graving dock entrance being ready, work was partially resumed during the quarter, and 12,000 cubic feet of masonry was built and 330,000 cubic feet excavation dug. About 22·5 per cent. of quay wall foundation and 18·7 per cent. of masonry remain to be done.

Graving Dock.—70,000 cubic feet of masonry and 85,000 cubic feet of earthwork were done during the quarter. 23·5 per cent. of the brickwork and 10·8 of foundation remain to be done.

Government Graving Dock.—Work on this dock was begun during the last quarter. 1,020,000 cubic feet of excavation were done during the quarter, and the timber trenching for the foundation is now in hand.

Dock No. 1.—364,385 cubic feet of the quay wall masonry and 3,528,992 cubic feet of excavation were done during the quarter. About 9·2 per cent. of brickwork and 24·3 of excavation remain to be done. During the quarter, 129 running feet of foundation was done, only 4·9 per cent. remaining to be done.

Boat Canal.—During the quarter, 774,093 cubic feet of excavation and 113,056 cubic feet of masonry were done, making in all about 70 per cent. of the total estimated amount. The erection of the main girders of the Diamond Harbour road bridge was nearly finished, and the rail arches for both this and the Tollygunge road bridge were completed. The erection of the gates of the lift lock is now in hand, and special measures are being taken for the excavation required in the Chetla Hat lock.

Subsidiary Works.—The hydraulic engine-house has been almost completed with the exception of the chimney shaft and the accumulator tower, and the engines and boilers have been erected in it. The foundations of the main pumping station are completed and ready for the erection of the machinery on its arrival from England.

Expenditure.—The total expenditure up to the end of the quarter under review is reported to be Rs. 1,62,15,553, of which Rs. 1,35,56,230 represents outlay on works and Rs. 26,58,623 outlay on account of land.

Sanitary.—A fever epidemic prevailed among the workpeople during the quarter which caused a considerable mortality and raised the death-rate to 48·61 per 1,000 per annum, against 12·56 in the previous quarter; the death-rate for the same quarter last year being 35·82. The average number of work-people employed during the quarter was 6,537, amongst whom there were 26·3 deaths.

GENERAL REMARKS.

We are of opinion that fair progress has been made with the works, and that, so far as we have been able to judge from a quarterly inspection, the quality of the work done is all that could be desired.

Rainfall, Weather, and State and Prospects of the Crops.

Statement showing Rainfall, Weather, and State and Prospects of the Crops in the different districts of Bengal, as reported to Government, during the week ending the 8th February, 1890.

No.	District and date of return.	Rainfall at Suider Station in inches.	Character of the weather and state and prospects of the crops.																
BENGAL.																			
<i>Western Districts.</i>																			
1	Burdwan Feb. 8, '90	Nil	Weather—cold. Outturn of <i>rubbi</i> and other winter crops rather unfavourable. Potato fair. Prices of common rice:— <div style="display: flex; justify-content: flex-end; align-items: center;"> <table style="margin-left: auto;"> <tr><td>Burdwan</td><td>...</td><td>...</td><td>Srs. 17½</td></tr> <tr><td>Culna</td><td>...</td><td>...</td><td>16</td></tr> <tr><td>Cutwa</td><td>...</td><td>...</td><td>16½</td></tr> <tr><td>Raneegunge</td><td>...</td><td>...</td><td>20</td></tr> </table> <div style="margin-left: 10px;">} per mpee.</div> </div>	Burdwan	Srs. 17½	Culna	16	Cutwa	16½	Raneegunge	20
Burdwan	Srs. 17½																
Culna	16																
Cutwa	16½																
Raneegunge	20																
2	Baukora .. 8, '90	Nil	Weather—seasonable. Prospects of <i>rubbi</i> crops continue good. Coarse rice selling at 19 seers per rupee at Sudder and 20 seers at Bishnupore.																
3	Birbhum .. 8, '90	Nil	Weather—seasonable. State and prospects of sugarcane and winter crops good. Rice selling at 16½ seers per rupee at Soory and 16 seers at Rampore Hat.																
4	Midnapur .. 8, '90	Nil	Weather—seasonable. General prospects fair. Harvesting of rice nearly over in Contai. Indigo and <i>rubbi</i> doing well. Prices of rice:— <div style="display: flex; justify-content: flex-end; align-items: center;"> <table style="margin-left: auto;"> <tr><td>Sudder</td><td>...</td><td>...</td><td>Srs. 18</td></tr> <tr><td>Contai</td><td>...</td><td>...</td><td>24</td></tr> <tr><td>Tamluk</td><td>...</td><td>...</td><td>18</td></tr> <tr><td>Ghatal</td><td>...</td><td>...</td><td>20</td></tr> </table> <div style="margin-left: 10px;">} per rupee.</div> </div>	Sudder	Srs. 18	Contai	24	Tamluk	18	Ghatal	20
Sudder	Srs. 18																
Contai	24																
Tamluk	18																
Ghatal	20																
5	Hooghly .. 8, '90	Nil	Weather—cold. <i>Rubbi</i> crops thriving well. Prices of common rice:— <div style="display: flex; justify-content: flex-end; align-items: center;"> <table style="margin-left: auto;"> <tr><td>Sudder and Serampore</td><td>...</td><td>...</td><td>Srs. 12½</td></tr> <tr><td>Jehanabad</td><td>...</td><td>...</td><td>17</td></tr> </table> <div style="margin-left: 10px;">} per rupee.</div> </div>	Sudder and Serampore	Srs. 12½	Jehanabad	17								
Sudder and Serampore	Srs. 12½																
Jehanabad	17																
	Howrah .. 8, '90	Nil	Weather—cool. <i>Rubbi</i> crops doing well. Transplantation of <i>boro</i> crop going on. Prices of common rice:— <div style="display: flex; justify-content: flex-end; align-items: center;"> <table style="margin-left: auto;"> <tr><td>Howrah</td><td>...</td><td>...</td><td>Srs. 13</td></tr> <tr><td>Uluberia</td><td>...</td><td>...</td><td>16</td></tr> </table> <div style="margin-left: 10px;">} per rupee.</div> </div>	Howrah	Srs. 13	Uluberia	16								
Howrah	Srs. 13																
Uluberia	16																
<i>Central Districts.</i>																			
6	24-Parghs. Feb. 8, '90	Nil	Weather—cool. <i>Amra</i> harvest completed. Threshing going on. <i>Rubbi</i> crops doing well. Ploughing going on in some parts. Common rice selling at 16 seers per rupee.																
7	Nuddea .. 8, '90	Nil	Weather—seasonable. Prospects of crops now on the ground favourable. Harvesting of sugarcane and <i>arhar</i> still going on. Ploughing for <i>am</i> rice has commenced.																
8	Khoolna .. 8, '90	Nil	Weather—seasonable. Reaping of <i>amra</i> completed; outturn 13 annas, as reported before. State of the <i>boro</i> crop, the transplantation of which is nearly completed, is good, and of <i>rubbi</i> fair.																
9	Jessore .. 8, '90	Nil	Weather—very cold. <i>Amra</i> harvesting nearly over; outturn 12 annas in Jhenidah. Spring crops doing fairly well. Price of new rice 14 to 16 seers per rupee.																
10	Moorsshedabad .. 8, '90	Nil	Weather—bright and cold. Prospects of <i>rubbi</i> continue good.																
11	Binagapur .. 8, '90	Nil	Weather—warm during the day and cold at night. Nights still very foggy and damp. Prospects of crops continue good.																
12	Rajshahye .. 8, '90	Nil	Weather—cold and seasonable. Harvesting of winter rice nearly finished with good outturn. Prospects of <i>rubbi</i> crops also good.																
13	Hungpur .. 8, '90	Nil	Weather—seasonable. Land is being prepared for <i>am</i> and jute. Prospects of tobacco, wheat and other <i>rubbi</i> crops continue good. Prices stationary.																
14	Bogra .. 8, '90	Nil	Weather—cold and pleasant. Foggy mornings. Reaping of <i>amra</i> finished. Other crops being reaped. Grain, <i>khesari</i> , <i>rai</i> , <i>poas</i> , and wheat promising. Rice sells at 22 seers per rupee at head-quarters.																
15	Pabna .. 8, '90	Nil	Weather—fine and cold. Outturn of <i>amra</i> in Serajgunge at least 14 annas, and in Sudder subdivision 12 annas. Sugarcane 8 annas. Mustard deficient. Other cold-weather crops satisfactory. Price of rice slightly lower.																
16	Darjeeling .. 8, '90	Nil	Weather—very cold and bright. Crop prospects generally favourable.																
17	Jalpigore .. 8, '90	Nil	Weather—seasonable. Cutting of <i>kaimasi</i> paddy completed and 14 annas outturn obtained. Condition of tobacco good. Prices stationary.																

No.	District and date of return.	Rainfall at weather station in inches.	Character of the weather and state and prospects of the crops.
BENGAL—concluded.			
<i>Eastern Districts.</i>			
Dacca Divn.	18 Dacca Feb. 8, '90	Nil	Weather—seasonable. Winter crops doing well. Mustard, pulses and sugarcane are being cut. Fodder is available. No special change in the prices of food-grains. Common rice 13 to 16 seers per rupee.
	19 Furreedpur .. 8, '90	Nil	Weather—seasonable. Prospects of <i>rubbi</i> crops fair. Sugarcane cultivation progressing. <i>Boro</i> being sown in char lands. Coarse rice selling at 14 seers per rupee at Sudder, 15 seers at Madaripore, and 17 seers at Ggalundo.
	20 Backergunge .. 8, '90	Nil	Weather—cool and fair. Harvesting of <i>amra</i> completed; outturn estimated at 16 annas. Common rice selling at 16 seers per rupee.
	21 Mymensingh .. 8, '90	Nil	Weather—cold and bright. Transplantation of <i>boro dhan</i> nearly completed. Mustard is being gathered. Prospects of crops good. Coarse rice 14 seers per rupee.
Chittagong Divn.	22 Chittagong .. 11, '90	Nil	Weather—seasonable. Prospects of chillies good.
	23 Noakholly .. 8, '90	Nil	Weather—seasonable. <i>Rubbi</i> crops doing well. Price of rice stationary.
	24 Tipperah .. 8, '90	Nil	Weather—bright and cool. <i>Boro dhan</i> is being transplanted. Land is being prepared for <i>amra</i> . Tobacco, onions, and chillies are thriving; mustard is being gathered.
	25 Chittagong Hill Tracts. .. 7, '90	Nil	Weather—very cold with dense fog in the morning, and hot at noon, throughout the week. Gathering of mustard continues. Tobacco, chillies and other winter crops progressing.
BEHAR.			
Patna Divn.	Hill Tipperah Feb. 8, '90	Nil	Weather—cold. Tobacco and sugarcane being cut. Cotton gathered; outturn fair.
	26 Patna .. 8, '90	Nil	Weather—cold. Mustard and <i>aghani rakar</i> are being harvested. Other spring crops doing well. Prospects of poppy continue favourable. Prices of food-grains almost stationary.
	27 Gya .. 8, '90	Nil	Weather—cold. Harvesting of paddy in course of completion. <i>Rubbi</i> coming on well. Poppy progressing.
	28 Shahabad .. 8, '90	Nil	Weather—bright and cold, but getting slightly warmer. Prospects of wheat and barley good. Peas and mustard being cut. Sugarcane being pressed. Poppy in flower and forward, and promises well if there be no rains. Prices stationary.
BAGULPORE DIVN.	29 Durbhunga .. 8, '90	Nil	Weather—cold and clear early in the week, slightly hotter at its close. Prospects of <i>raabi</i> continue favourable. Mustard is being harvested. Recent rain has done much good to poppy crop. Prices of common rice range from 19 to 22½ seers per rupee.
	30 Mozufferpur .. 8, '90	Nil	Weather—seasonable. Prospects of all crops continue very favourable.
	31 Saran .. 8, '90	Nil	Weather—clear and cold. Prospects of <i>rubbi</i> excellent. Harvesting of peas and mustard commenced; outturn favourable. Poppy looks well and continues to give a good report.
	32 Champaran .. 8, '90	Nil	Weather—seasonable. Reaping of mustard nearly finished; estimated outturn 12 annas. <i>Rubbi</i> doing well. Poppy generally in flower; prospects excellent. Prices stationary.
	33 Monghyr .. 8, '90	Nil	Weather—seasonable. Days getting hot. Prospects of <i>rubbi</i> crops continue favourable, and an outturn of 14 annas on the whole expected. A shower of rain would still benefit the crops.
	34 Bhagalpur .. 8, '90	Nil	Weather—cold and dry. Crops on the whole doing well, but would be improved by rain. In Saseepur, crops said to be suffering from want of rain.
	35 Purneah .. 8, '90	Nil	Weather—reasonably cold. Tobacco and other cold-weather crops doing well, having been benefited by the late rain.
	36 Maldah Feb. 8, '90	Nil	Weather—cold. <i>Katki</i> and mustard still being gathered. Transplantation of <i>boro</i> going on. Prospects of other standing crops good. Common rice selling at an average of 18 seers per rupee.
	37 Sonthal Pergna. .. 8, '90	Nil	Weather—seasonable. <i>Aghani</i> outturn in Godda 12 annas. <i>Rubbi</i> promises to yield 12 annas for the whole district. Prices falling.

No.	District and date of return.	Rainfall at Sudder Station in inches.	Character of the weather and state and prospects of the crops.
ORISSA.			
ORISSA DIV.	38 Cuttack Feb. 8, '90	Nil	Weather—misty in the morning. The subdivisional officer of Jajpore reports that the outturn of <i>guru sarad</i> should be 16 and not 17 annas, as stated before. Prospects continue good.
	39 Pooree ...	...	Report not received.
	40 Balasore .. 8, '90	Nil	Weather—warmer. Such <i>rabbi</i> crops as there are, doing fairly well.
CHOTA NAGPORE.			
<i>South-West Frontier Agency.</i>			
CHOTA NAGPORE DIV.	41 Hazaribagh Feb. 8, '90	Nil	Weather—seasonable. Prospects generally good, except at Chatra and Chauran, where a full crop is not expected. Rain would do good.
	42 Lohardugga .. 8, '90	Nil	Weather—seasonable and very cold. Prospects of <i>rabbi</i> at head-quarters good. Hoar-frost has caused much damage to this crop in Palamow, especially to <i>raher</i> pulse. Mustard is being now reaped.
	43 Singhbhum .. 8, '90	Nil	Weather—seasonable. Prospects of crops favourable. Outturn of sugarcane 12 to 16 annas; <i>surajya</i> 10 to 16 annas; <i>mohua</i> 10 to 12 annas; other oil-seeds 10 to 16 annas. Gram doing well. Prices stationary.
	44 Manbhum .. 8, '90	Nil	Weather—getting warmer. Sugarcane is being pressed; outturn full average in Sudder subdivision and about 13 annas in Govindpore. <i>Arher</i> , <i>thasari</i> , and wheat ripening; probable outturn 14 annas. Rice selling at from 20 to 24 annas per rupee.

Published for general information.

CALCUTTA; REVENUE DEPT.,
The 11th February, 1890.P. NOLAN,
Secy. to the Govt. of Bengal.

PRICES-CURRENT (retail) of Food-grains, Firewood and Salt in the

Number.		DISTRICTS.	QUANTITIES PER RUPEE IN																	
			WHEAT.			BARLEY.			RICE, BEST SORT.			RICE, COMMON.			JOWAR OR CHOLUR. (Sorghum Vulgare.)					
			Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.			
BENGAL.																				
Western Districts.																				
1	Bardwan	14 8	13 8	13 4	No sale.			12 12	15 0	15 12	16 14	16 5	18 0	...	...	...	
2	Bankura	14 8	14 8	12 4	14 0	14 0	14 8	17 8	17 0	17 8	21 0	21 0	21 0	...	...	...	
3	Boorhoom	16 8	16 8	11 0	...	...	...	13 8	12 0	13 0	16 8	15 0	15 12	...	...	...	
4	Midnapore	13 0	13 0	13 5	...	...	...	12 8	12 8	15 0	17 0	16 8	20 0	...	...	...	
5	Hooghly	13 0	13 0	13 0	...	...	...	8 0	8 0	10 0	13 0	12 0	13 0	...	...	...	
	Howrah	...	...	...	...	...	...	9 8	9 8	12 0	14 0	14 0	14 8	...	...	...	
Central Districts.																				
6	Calcutta	13 12	13 6	12 9	13 0	16 9	15 11	9 2	6 11	9 10	13 14	13 8	14 14	20 8	19 4	17 8				
7	24-Pergunnahs	15 0	14 8	12 8	16 0	16 0	14 0	12 0	12 0	8 0	16 8	16 8	16 0	...	...	...	
8	Nudda	15 0	15 0	13 14	17 12	17 12	22 14	10 10	10 10	12 5	12 14	13 4	17 14	...	...	...	
9	Khoolna	...	...	...	...	...	...	13 0	14 0	14 4	16 0	16 0	16 0	...	...	...	
10	Jessore	12 12	13 5	12 0	...	...	...	9 0	9 0	14 0	16 0	16 0	17 0	...	...	...	
11	Moorshedabad	16 0	16 0	13 5	...	...	...	15 8	15 8	13 5	16 0	17 0	17 0	...	...	...	
12	Dinapore	16 0	17 4	12 0	19 0	16 0	12 0	14 0	15 8	14 6	19 0	19 0	17 1	...	...	...	
13	Rajahmbye	{ 15 0 16 8 }	15 0	12 0	18 12	18 12	23 4	14 4	13 8	13 8	16 2	15 12	15 0	...	...	...	
14	Rangpore	14 8	14 8	12 4	...	...	...	9 6	9 6	10 8	14 8	14 8	16 12	...	...	...	
15	Bogra	{ Best sort. 13 5 Common. 16 8 }	13 5	7 14	...	...	...	12 0	12 0	12 0	16 12	19 8	18 12	...	...	...	
16	Patna	13 5	13 8	16 8	...	...	...	7 2	7 4	7 2	16 8	15 14	18 0	...	...	...	
17	Darjeeling	10 0	10 0	10 0	10 0	10 0	10 0	5 8	5 0	5 0	10 0	12 0	13 0	...	...	...	
18	Jalpigoree	13 0	13 0	10 0	16 0	16 0	16 0	8 0	8 0	8 0	17 0	17 0	18 0	...	...	...	
Eastern Districts.																				
19	Dacca	13 0	13 0	15 8	16 0	16 0	20 0	14 0	14 0	16 0	16 0	16 0	17 0	...	...	...	
20	Furzedpore	12 0	12 0	18 0	12 6	12 0	18 0	10 0	10 0	8 0	14 0	14 0	16 0	...	...	...	
21	Backergunge	...	...	...	...	...	...	13 5	13 5	13 5	16 0	16 0	15 9	...	...	...	
22	Mymensingh	11 8	10 0	9 0	...	...	...	10 8	10 0	12 0	14 0	12 12	19 0	...	...	...	

- A In subdivisions retail prices of salt per rupee are:—Gulna 10 seers, Cutwa 10 seers 6 chittacks and Haneegunge 10 seers.
 B At Rampore Haut retail price of salt 10½ seers per rupee.
 C In subdivisions retail prices of salt per rupee are:—Goutal 10 seers, Tumlook 8 seers, and Ghattal 10½ seers.
 D In subdivisions retail prices of salt per rupee are:—Serampore 10 seers and Jehanabad 10 seers.
 E In subdivisions retail prices of salt per rupee are:—Baraset 9 seers, Basirhat 9 seers, Diamond Harbour (at Magrahat) 8 seers, Barrackpore 9 seers 2 chittacks, and Dum-Dum 10 seers.
 F In subdivisions retail prices of salt per rupee are:—Koochta 10 seers, Meherpore 10½ seers, Choochanga 9 seers, and Kanaghat 9 seers 2 chittacks.
 G In subdivisions retail prices of salt per rupee are:—Batkira 9 seers and Bagirhat 8 seers.
 H In subdivisions retail prices of salt per rupee are:—Jhanida 9 seers, Magura 1½ seers, Narail 9½ seers, and Bongong 10 seers.
 I In subdivisions retail prices of salt per rupee are:—Lalbagh 10 seers, Jungipore 10 seers, and Kandi 11 seers.

SEEDS OF 80 TOLAHS.

HAJRA OR CUMBU. <i>Pennisetum typhoides.</i>			MARUA OR RAGI. <i>(Eleusine Coracana.)</i>		
Present return.	Next preceding return.	Corresponding turn of last year.	Present return.	Next preceding return.	Corresponding turn of last year.

8. Ch. 8. Ch. 8. Ch. 8. Ch. 8. Ch. 8. Ch. 8.

1.0	0.00	0.00	0.00	0.00
0.9	0.00	0.00	0.00	0.00
0.8	0.00	0.00	0.00	0.00
0.7	0.00	0.00	0.00	0.00
0.6	0.00	0.00	0.00	0.00
0.5	0.00	0.00	0.00	0.00
0.4	0.00	0.00	0.00	0.00
0.3	0.00	0.00	0.00	0.00
0.2	0.00	0.00	0.00	0.00
0.1	0.00	0.00	0.00	0.00
0.0	0.00	0.00	0.00	0.00

[illegible]

1	000	000	000	000
2	000	000	000	000
3	000	000	000	000
4	000	000	000	000
5	000	000	000	000
6	000	000	000	000
7	000	000	000	000
8	000	000	000	000
9	000	000	000	000
10	000	000	000	000

KANONI OR KARUN, ITALIAN MILLET. (<i>Setaria italica</i> .)			GRAM, CHANA, CHHOLA, KADALAT OR SUNAGA. (<i>Cleor aristatum</i> .)		
Present return.	Next preceding re- turn.	Corresponding re- turn of last year.	Present return.	Next preceding re- turn.	Corresponding re- turn of last year.

S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.
...	20	0	18	0	16	0
...	16	4	16	0	14	8
...	11	0	16	0	16	0
...	16	0	16	0	14	0
...	16	0	16	0	13	0
...	16	12	17	0	15	8

15	14	16	0	16	10	16	9	16	4	14	15
6	8	5	0	12	5	18	13	18	13	15	0
...	...	...	...	20	0	20	0	16	0		
...	...	...	...	13	0	13	0	16	0		
...	...	...	...	16	0	16	0	15	0		
...	...	...	...	21	0	21	0	16	0		
...	...	...	...	14	4	15	0	11	0		
...	...	...	...	18	12	18	0	15	0		
...	...	...	...	14	8	14	8	10	0		
...	...	...	...	13	8	14	4	9	13		
...	...	...	...	15	12	15	0	15	0		
...	...	...	...	10	0	10	0	10	0		
...	...	...	...	18	0	18	0	11	0		

...	...	...	...	19	0	18	0	13	0		
...	...	...	...	11	0	11	0	16	0		
...	...	...	...	15	0	15	3	15	13		
...	...	...	...	14	8	13	0	13	8		

Head-quarter Station Bazaar of the Districts of Bengal on the 31st January 1880.

INDIAN-CORN OR MAIZE (See Note.)															ARAR OR TUR. CADIAN PEA. (Onjans indiana.)															FIREWOOD.															SALT.															SALT.															WHOLESALE PRICES PER MAUND OF 40 BEERS.															DISTRICTS.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
Present return.					Next preceding return.					Corresponding return of last year.					Present return.					Next preceding return.					Corresponding return of last year.					Present return.					Next preceding return.					Corresponding return of last year.					Present return.					Next preceding return.					Corresponding return of last year.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S

J In Thakurgaon subdivision retail price of salt 8 seers per rupee.
K In subdivisions retail prices of salt per rupee are:—Nattoro 9 seers and Nowgong 9 seers 11 chittacks.
L In subdivisions retail prices of salt per rupee are:—Kurigram 9 seers, Nilphamari and Gaibandha 8 seers.
M At Ranganj retail price of salt Rs. 4-4 per maund.
N At Biliguri wholesale price of salt Rs. 4-4 per maund.
O At Pallante in Alipore subdivision retail price of salt 8 seers per rupee.
P In subdivisions retail prices of salt per rupee are:—Maulabangungo 8 seers, Moonshegungo 8 seers 14 chittacks, and Naraingungo 10 seers.
Q In subdivisions retail prices of salt per rupee are:—Patuakhali 9 seers, Persepore 9 seers, and Bhola 8 seers.
R In subdivisions retail prices of salt per rupee are:—Kishoregungo 8 seers, Jamalpore 10 seers, Shibpur 9 seers, and Moturkone 8 seers.

PRICES-CURRENT (retail) of Food-grains, Firewood and Salt in the Head-quarter

Number.		DISTRICTS.	QUANTITIES PER RUPEE IN														
			WHEAT.			BARLEY.			RICE, BEST SORT.			RICE, COMMON.			JOWAR OR OHOLUN. (Sorghum Vulgare.)		
			Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.
Eastern Districts—concluded.																	
32	Chittagong	11 0	11 0	11 0	...	...	...	11 0	11 0	12 0	15 11	15 11	16 8	...	...	...
33	Noakhally	...	...	...	...	...	...	16 0	16 0	16 0	18 0	18 0	18 0	...	...	...
34	Tipperah	11 7	11 7	12 8	...	...	...	Gohindabag. Chap. 10 0	10 0	17 0	16 0	16 0	21 0	...	...	...
35	Chittagong Hill Tracts	...	...	...	...	...	...	12 4	10 0	11 6	14 0	11 6	14 8	...	...	...
	Hill Tipperah	6 0	6 0	6 0	...	...	...	8 0	8 0	10 0	15 0	14 0	19 0	...	...	...
BEHAR.																	
26	Patna	17 8	17 6	...	24 0	24 0	21 0	10 8	10 8	11 0	17 14	18 0	15 8	22 0	22 0	21	
		15 8	15 8	17 0	...	...	...	...	...	...	...	...	...	...	...	...
27	Oya	16 0	16 8	13 8	23 0	23 0	15 0	10 8	10 0	9 8	17 0	17 0	15 0	...	...	...
28	Shahabad	16 0	16 0	15 4	23 0	22 0	17 0	9 0	9 8	9 0	17 0	17 0	14 4	23 0	21 0	18 4	
29	Darbhanga	13 8	15 6	12 0	27 8	3 12	16 8	9 14	...	11 0	19 3	20 4	14 0	...	...	...
30	Moufferpore	14 0	14 0	12 0	20 0	20 0	...	9 0	12 0	9 0	17 0	18 0	13 0	...	...	...
31	Sarus	15 8	16 0	15 0	21 0	20 0	20 8	9 4	8 8	8 8	17 6	15 8	13 8	...	...	...
32	Champan	13 0	13 0	12 0	...	...	19 0	10 0	9 0	8 0	19 0	18 8	13 0	...	...	...
33	Monghyr	18 10	18 10	15 8	21 0	21 0	...	16 12	13 2	14 0	19 11	18 13	17 1	...	...	...
34	Bhagulpore	16 6	14 11	15 2	20 3	20 8	17 10	11 6	18 0	14 13	18 5	17 10	16 13	...	...	...
35	Purneah	18 0	20 0	13 4	...	...	...	18 0	18 0	16 0	19 0	19 0	17 0	...	...	...
36	Maldah	16 0	18 0	13 0	...	...	...	8 0	12 0	13 0	17 0	17 0	16 0	...	...	...
37	Benthal Perga.	13 0	13 4	11 8	...	...	...	12 0	12 0	12 8	17 0	17 0	18 0	...	...	...
ORISSA.																	
38	Cuttack	11 13	11 13	13 2	...	...	...	10 8	10 8	11 13	22 5	19 11	18 6	...	...	...
39	Pooree	13 2	11 13	13 2	...	...	...	15 12	15 12	13 2	23 10	22 10	18 6	...	...	...
40	Balasore	15 0	15 0	13 0	13 0	13 0	13 0	13 0	13 0	13 0	19 0	19 0	19 8	...	...	...
CHOTA NAGPORE.																	
South-West Frontier Agency.																	
41	Hamirbagh	13 8	13 0	13 0	15 0	12 0	8 0	10 0	10 0	8 0	18 0	18 0	16 0	...	...	...
42	Lohardugga	13 12	13 8	10 8	...	13 0	...	17 0	17 0	13 0	20 0	19 8	16 8	...	...	...
		11 12	...	...	...	...	...	...	...	...	22 0	22 0	...	...	...	...
43	Singbhoom	10 0	10 0	15 0	15 0	20 0	14 0	18 0	16 0	16 0	20 0	20 0	20 0	...	...	...
44	Manbhoom	13 5	13 5	11 14	...	...	...	14 0	15 0	14 0	20 0	23 0	21 0	...	...	...

S At Cox's Bazar retail price of salt 8 seers per rupee.

T At Ferry Hat retail price of salt 6 seers per rupee.

U In subdivisions retail price of salt per rupee are:—Buxar 10½ seers, Samrat 10½ seers, and Shahabad 9½ seers.

V In subdivisions retail price of salt per rupee are:—Tipperah 11 seers and Madhubani 10 seers.

W In subdivisions retail price of salt per rupee are:—Mayapuri 9½ seers and Bitanarhi 10 seers.

X At Bettiah retail price of salt 10 seers per rupee.

CALCUTTA,
The 11th February, 1890.

RENS OF 80 TOLARS.

RAJRA OR COMBU.
(*Pennisetum typho-*
idum.)

MANDA OR RAGI.
(*Eleusine Corocana*.)

Present return.	Next preceding re- turn.	Corresponding re- turn of last year.	Present return.	Next preceding re- turn.	Corresponding re- turn of last year.
-----------------	-----------------------------	---	-----------------	-----------------------------	---

Ch. S. Ch. S. Ch. S. Ch. S. Ch. S. Ch.

...
...
...
...
...

...	...	...	27	0	27	0	...
...
...
...	...	...	26	7	28	8	19 0
...
...	...	...	22	0	23	0	20 0
...	...	...	...	...	...	20	0
...
...
...
...
...

...
...
...

...	...	...	30	0	27	0	30 0
...	...	...	35	0	35	0	35 8
...
...

KARONI OR KARUN. ITALIAN MILLET. (<i>Setaria italica</i> .)			GRAM, CHANA, CHHOLA, KADALAY OR BUNAGA. (<i>Cicer arislinum</i> .)		
--	--	--	--	--	--

Present return.	Next preceding turn.	Corresponding turn of last year.	Present return.	Next preceding turn.	Corresponding turn of last year.
-----------------	-------------------------	-------------------------------------	-----------------	-------------------------	-------------------------------------

S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.	S.	Ch.
...	12	0	12	0	11	10
...	10	0	10	0	12	0
...	13	14	13	14	16	0
...
...	12	0	12	0	10	0

19	0	19	0	15	0	23	0	23	8	19	0
15	0	15	0	14	0	20	0	20	0	17	0
...	...	...	...	21	0	20	8	19	0	...	...
...	...	...	...	22	0	20	0	23	0	18	0
...	...	...	...	18	0	18	8	16	0	...	...
16	0	13	0	15	0	20	8	20	8	17	8
...	...	...	...	23	0	22	0	16	0	...	...
14	12	...	...	11	9	21	0	23	1	18	10
...	...	...	...	20	3	20	3	16	6	...	...
...	...	...	...	16	0	16	0	18	0	...	...
...	...	...	...	13	0	18	0	14	0	...	...
...	...	...	...	16	0	16	0	13	8	...	...

...	...	...	...	15	12	14	7	19	11
...	...	...	...	17	1	15	12	17	1
...	...	...	...	14	0	14	0	12	6

...	...	...	...	16	0	16	0	15	0
...	...	...	...	14	12	14	0	19	0
...	...	...	...	10	0	10	0	12	0
...	...	...	...	15	3	16	0	13	6

Station Bazars of the Districts of Bengal on the 31st January 1890—(concluded).

												WHOLESALE PRICES PER MAUND OF 40 SEERS.						DISTRICTS.
INDIAN-CORN OR MAIZE. (Zea Mays.)			ARHAR OR TUR. CAJAN PEA. (Cajanus indicus.)			FIREWOOD.			SALT.			SALT.						
Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.				
S. Ch.	S. Ch.	N. Ch.	S. Ch.	S. Ch.	N. Ch.	S. Ch.	S. Ch.	N. Ch.	S. Ch.	S. Ch.	N. Ch.	S. Ch.	S. Ch.	N. Ch.				
...	...	...	...	...	...	110	0 100	0 108	0 9 0	9 0	9 4	4 0 0	4 0 0	3 14 0	Chittagong.
...	...	...	7 0	7 0	...	...	...	...	9 0	9 0	8 0	4 0 0	4 0 0	4 8 0	Noakholly.
...	...	...	8 6 8	8 0 8	8 0	...	...	...	8 14	8 14	8 0	4 8 0	4 8 0	4 8 0	Tipperah.
...	...	...	...	...	...	320	0 320	0 320	0 8 0	8 0	8 0	4 8 0	4 8 0	4 8 0	Chittagong Hill Tracts.
...	...	...	8 0	8 0	8 0	...	...	...	8 0	8 0	8 0	4 8 0	4 8 0	4 8 0	Hill Tipperah.
Eastern Districts—concluded.																		
22 8	23 0	21 0	21 8	21 0	23 0	130	0 130	0 130	0 10 0	10 0	10 0	3 14 0	3 14 0	3 12 0	Patna.			
...	...	...	19 0	19 0	18 0	160	0 160	0 200	0 9 2	9 2	8 12	4 8 0	4 2 0	4 2 9	Gya.	
...	...	...	19 0	20 0	14 0	140	0 140	0 160	0 9 12	10 0	10 0	3 15 6	3 15 0	4 0 0	Shahabad.	
24 3	24 8	19 12	19 8	18 8	22 0	200	0 160	0 160	0 10 0	10 0	11 0	3 12 0	3 12 0	3 10 3	Darbhanga.			
26 0	22 8	17 0	18 0	18 0	20 0	160	0 160	0 160	0 10 0	10 0	10 0	4 0 0	3 12 0	3 12 0	Muzaffarpore.			
31 12	21 0	20 8	19 8	19 0	20 8	160	0 160	0 160	0 9 8	9 8	10 0	4 0 0	4 2 0	3 14 6	Saran.			
24 8	24 0	17 8	17 8	17 0	22 0	160	0 160	0 160	0 10 0	9 8	9 0	4 1 0	4 3 0	4 2 0	Chumparun.			
22 1	24 2	16 13	16 12	17 13	18 5	147	0 147	0 147	0 9 11	9 11	9 8	4 0 0	4 0 0	4 0 0	Monghyr.			
22 11	22 11	17 2	17 11	17 11	17 10	164	0 164	0 176	8 10 1	10 1	9 0	3 15 6	3 15 6	4 0 0	Bhagulpore.			
...	...	...	16 0	16 0	16 0	120	0 130	0 200	0 9 0	9 8	9 0	4 7 0	4 3 4	4 5 0	Purneah.	
...	...	...	...	...	...	160	0 160	0 200	0 9 0	9 0	10 0	4 4 0	4 0 0	4 0 0	Maldah.
25 0	25 0	20 0	20 0	20 0	24 0	200	0 200	0 200	0 9 0	9 0	9 0	4 0 0	4 2 0	4 3 0	Sonthal Pergas.			
ORISSA.																		
...	...	...	14 7	14 7	17 1	80	0 80	0 80	0 11 0	11 0	11 0	3 12 0	3 12 0	3 12 0	Cuttack.	
...	...	...	15 12	14 7	16 12	80	0 80	0 80	0 11 13	11 13	11 13	3 6 0	3 6 0	3 6 0	Pooree.	
...	...	...	...	...	...	160	0 160	0 160	0 10 0	10 0	9 12	3 14 0	3 14 0	3 13 6	Balasore.
CHOTA NAGPORE.																		
South-West Frontier Agency.																		
21 0	21 0	16 0	17 0	15 0	16 0	320	0 320	0 320	0 8 0	8 0	8 0	4 6 0	4 6 0	4 8 0	Hazaribagh.			
30 0	30 0	19 0	16 0 Big. Small. 17 0	15 4	17 0	140	0 130	0 140	0 8 8	8 4	8 8	4 6 0	4 9 0	4 8 0	Lohardugga.			
24 0	32 0	...	13 0	13 0	15 0	240	0 240	0 200	0 8 8	7 0	7 0	4 12 0	5 8 0	5 8 0	Singbhoom.			
33 0	32 0	23 0	20 0	19 0	17 0	200	0 200	0 200	0 9 2	9 2	9 0	4 2 0	4 2 0	4 2 0	Nanbhoom.			

Y In subdivisions retail prices of salt per rupee are:—Begunseri 2½ seers and Jamui 9 seers.
 Z In subdivisions retail prices of salt per rupee are:—Kushungunge 8 seers and Arraroah (at Ranigunge) 9 seers.
 Z1 In Khordah subdivision retail price of salt 10 seers per rupee.
 Z2 At Bhadrak retail price of salt 8 seers per rupee.
 Z3 At Gündpore retail price of salt 9 seers per rupee.

Published for general information.

P. NOLAN,
 Secy. to the Govt. of Bengal.

PRICES-CURRENT (wholesale) of Food-grains, Firewood, and Salt

Number.	MARKS.	WHEAT.			BARLEY.			RICE, BEST SORT.			RICE, COMMON.		
		Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.
		R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.
1	Calcutta ...	2 10 9	2 11 8	2 14 10	1 15 11	2 2 7	2 5 2	4 2 7	4 5 9	3 14 5	2 10 1	2 11 5	2 7
2	Berajunge ...	2 4 0	2 0 0	2 10 0	...	...	...	5 8 0	5 4 0	3 12 0	2 10 0	2 10 0	2 10
3	Dacca ...	3 0 0	3 0 0	2 8 0	2 7 0	2 7 0	2 0 0	2 14 0	2 14 0	7 0	2 7 0	2 7 0	2 5
4	Narainjunge ...	...	...	...	...	...	...	3 0 0	3 0 0	2 6 0	2 12 0	2 12 0	2 4
5	Chittagong ...	3 8 0	3 8 0	3 9 0	...	...	...	3 8 0	3 8 0	3 4 0	2 9 0	2 9 0	2 7
6	Patna ...	2 4 0 Red. 2 8 0 White.	2 4 6 2 8 0	...	1 10 0	1 10 0	1 13 0	3 12 0	3 12 0	3 8 0	2 4 0	2 5 0	2 7
7	Balasore ...	2 8 0	2 8 0	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 0 0	3 4 0	2 0 0	2 0 0	1 14
8	Poorce ...	...	...	...	...	...	...	...	...	...	1 12 0	1 15 0	2 0
	Cuttack ...	3 4 0	3 4 0	3 0 0	...	...	...	3 0 0	3 0 0	3 4 0	1 14 0	2 0 0	2 2

CALCUTTA,
The 11th February, 1890.

PRICES PER MAUND

JOWAR OR CHOLU. (<i>Sorghum Vulgare</i> .)			BAJRA OR CUMBU. (<i>Pennisetum typhoides</i> .)		
Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.
R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.
1 11 01	13 02	0 52	8 72	9 72	15 6
...
...
...
...
1 12 01	12 01	14 0	...	...	...
...
...
...

OF 40 BEERS

MAMUA OR RAOL (Elemanu Corocana.)			KANOI OR KAKU ITALIAN MULET. (Setaria italica.)		
Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.
R.A.P.	R.A.P.	R.A.P.	R.A.P.	R.A.P.	R.A.P.
...	2 4 42 402 26	...	...
...
...
...
...
170 170	2 0 02 402 96	...	...
...
...
...

in the undermentioned Marts of Bengal on the 31st January 1890.

GRAM, CHAWA, OHOLA, KADALAY OR SUNAGA. (Cicer Aristinum.)			INDIAN-CORN OR MAISE. (Zea Mays.)			ARHAR OR THUR. CADJAN P'RA. (Cajanus indicus.)			PIKEWOOD.			SALT.			MARTS.
Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	Present return.	Next preceding return.	Corresponding return of last year.	
R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	R. A. P.	
2 8	2 3 5	2 7 0	1 15 0	1 14 7	2 0 8	1 15 10	2 2 9	2 2 9	0 5 6	0 5 6	0 5 9	3 11 0	3 11 6	3 10 2	Calcutta.
11 0	2 8 0	3 0 0	...	...	...	...	...	...	...	...	...	4 0 0	4 0 0	3 11 0	Serajgunge.
0 0	3 0 0	3 0 0	...	...	...	2 12 0	2 12 0	2 8 0	0 4 0	0 4 0	0 5 0	4 4 0	4 4 0	4 0 0	Dacca.
2 0	3 0 0	3 0 0	...	...	...	3 4 0	3 4 0	3 2 0	0 8 0	0 8 0	0 10 0	3 12 0	4 0 0	3 12 0	Naraingunge.
0 0	3 0 0	3 4 0	...	...	...	...	...	...	0 6 0	0 7 0	0 5 3	4 0 0	4 0 0	3 14 0	Chittagong.
11 6	1 11 6	2 1 0	1 11 0	1 11 6	1 13 0	1 13 0	1 14 0	1 10 0	0 5 0	0 5 0	0 5 0	3 14 0	3 14 0	3 12 0	Patna.
12 0	2 12 0	3 0 0	...	...	...	...	...	...	0 4 6	0 4 6	0 4 6	3 14 0	3 14 0	3 13 6	Balasore.
...	...	...	...	...	...	...	...	...	...	...	...	3 6 0	3 6 0	3 6 0	Pooree.
3 0	3 12 0	2 0 0	...	...	...	2 12 0	2 12 0	3 0 0	0 8 0	0 8 0	0 8 0	3 12 0	3 12 0	3 12 0	Cuttack.

Published for general information.

P. NOLAN,
Secy. to the Govt. of Bengal.

STATEMENT SHOWING THE STOCKS OF RICE IN AND AROUND CALCUTTA.

STOCK IS SHOWN AS COMPILED ON—													
NAMES OF MARKS.	1st week of Feb. 1889.	1st week of Mar. 1889.	1st week of April 1889.	1st week of May 1889.	1st week of June 1889.	1st week of July 1889.	1st week of August 1889.	1st week of Sept. 1889.	2nd week of Oct. 1889.	1st week of Nov. 1889.	1st week of Dec. 1889.	1st week of Jan. 1890.	1st week of Feb. 1890.
Bellaghatta	Mds. 7,77,000	Mds. 12,77,000	Mds. 12,42,000	Mds. 7,67,500	Mds. 8,72,000	Mds. 7,32,700	Mds. 6,62,000	Mds. 6,06,000	Mds. 6,54,000	Mds. 2,94,500	Mds. 2,04,000	Mds. 2,44,000	Mds. 2,44,000
Ootidanga	71,400	80,800	87,100	82,500	88,000	86,500	78,700	74,400	71,900	67,600	85,400	63,600	82,200
Chittora, Gohabara, Gomer-tally, Hattah, and Guppy Ghat.	6,93,600	7,00,200	7,64,000	7,54,200	6,96,500	6,83,600	6,97,700	8,78,300	6,74,100	6,32,300	5,96,000	6,06,600	6,36,200
Patturichatta, Posta, and Jorabagan.	2,500	2,000	2,500	2,000	2,500	2,000	2,000	4,000	2,000	2,000	2,000	2,000	2,000
Tallavren, Chittich, Kaddapore, and Moushikur.	1,26,000	1,37,600	1,48,100	1,39,000	1,19,700	1,03,700	1,10,700	72,500	64,500	68,200	66,100	82,750	66,100
21 Minor Bazar (estimated) ...	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000
Other retail shops, 8,129 in number (estimated).	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000	2,40,000
Beldaghatt, Newaburga, Chaudhurer, and Chander-majora.	14,924	20,403	19,792	20,404	19,023	19,904	18,117	14,205	14,303	12,410	14,600	26,623	19,005
Total	21,80,000	27,13,203	27,72,192	27,50,606	21,84,123	22,50,806	21,39,917	18,98,605	18,22,222	17,37,310	15,13,000	15,08,976	16,63,006
On Railway premises on both sides of the river	15,074 (on 4th Feb. 1889)	6,953 (on 3rd Mar. 1889.)	23,414 (on 4th Apr. 1889.)	12,404 (on 4th May 1889.)	6,574 (on 3rd June 1889.)	7,730 (on 3rd July 1889.)	4,179 (on 3rd Aug. 1889.)	9,606 (on 3rd Sept. 1889.)	4,204 (on 3rd Oct. 1889.)	14,011 (on 3rd Nov. 1889.)	6,677 (on 3rd Dec. 1889.)	29,007 (on 3rd Jan. 1890.)	26,025 (on 3rd Feb. 1890.)
On boats un-loaded — { By Port Com-missioners' re-turns.	(1st to 3rd Feb. 1889.)	(1st to 3rd Mar. 1889.)	(1st to 3rd Apr. 1889.)	(1st to 3rd May 1889.)	(1st to 3rd June 1889.)	(1st to 3rd July 1889.)	(1st to 3rd Aug. 1889.)	(1st to 3rd Sept. 1889.)	(1st to 3rd Oct. 1889.)	(1st to 3rd Nov. 1889.)	(1st to 3rd Dec. 1889.)	(1st to 3rd Jan. 1890.)	(1st to 3rd Feb. 1890.)
{ By Canal returns	1,43,473 (1st to 3rd Feb. 1889.)	80,450 (1st to 3rd Mar. 1889.)	96,713 (1st to 3rd Apr. 1889.)	8,978 (1st to 3rd May 1889.)	15,997 (1st to 3rd June 1889.)	27,100 (1st to 3rd July 1889.)	29,316 (1st to 3rd Aug. 1889.)	19,381 (1st to 3rd Sept. 1889.)	48,023 (1st to 3rd Oct. 1889.)	14,719 (1st to 3rd Nov. 1889.)	28,545 (1st to 3rd Dec. 1889.)	31,314 (1st to 3rd Jan. 1890.)	2,42,044 (1st to 3rd Feb. 1890.)
Grand total of Stocks	22,53,406	28,34,003	28,62,706	27,60,997	22,22,644	23,50,932	22,90,673	19,48,288	18,97,916	17,51,923	15,49,943	17,30,489	21,51,201
Probable stock available for exportation by sea.	12½ lakhs	1½ lakhs	19 lakhs	17½ lakhs	11½ lakhs	12½ lakhs	15½ lakhs	9 lakhs	9½ lakhs	7½ lakhs	6 lakhs	7½ lakhs	11½ lakhs

STATISTICAL DEPARTMENT,
The 10th February, 1890.P. NOLAN,
Secy. to the Govt. of Bengal.

Abstract of the results of Meteorological Observations taken at the Alipore Observatory in the month of January 1890.

	Inches.	Date.	Hour.
The mean pressure of the month	29.946		
The average pressure of January from 24 years' registers	30.014		
The highest pressure in the month	30.128	29th	16
The lowest pressure in the month	29.736	24th	16
The range of pressure	0.392		
Hours.			
The total number of hours of bright sunshine during the month	273.7		
The maximum possible number of hours of sunshine	337.3		
°			
The mean temperature of the month	66.3		
The average temperature of January from 24 years' registers	67.7		
The highest temperature in the month	81.7	24th.	
The lowest temperature in the month	47.6	28th.	
The range of temperature during the month	34.1		
The mean daily range of temperature	20.5		
The greatest range of temperature in one day	25.8	28th.	
Per cent.			
The mean humidity of the month	74		
The average humidity of January from 24 years' registers	71		
Inches.			
The mean vapour tension of the month	0.469		
The average vapour tension of January from 9 years' registers	0.467		
The mean cloud proportion of the month	0.82		
The average cloud proportion of January from 13 years' registers	1.46		
Inches.			
The total rainfall of the month	0.77		
The total rainfall indicated by a Beckley's self-registering rain-gauge (mouth of the gauge about 52 feet above the ground)	0.76		
The average fall of January from 48 years' registers	0.43		
The greatest fall in 24 hours	0.77	25th.	
Days.			
The number of rainy days in the month	1		
The average number of rainy days in January from 24 years' registers	2		
°			
The mean maximum equilibrium temperature of solar radiation during the month	130.9		
The mean difference of sun and air temperatures	54.0		
The greatest sun temperature	135.5	8th.	
The greatest excess of sun over air temperature	59.0	24th and 29th.	
The mean temperature of the nocturnal radiation thermometer on woollen cloth	48.7		
The mean depression of the nocturnal radiation thermometer below the minimum air temperature at 4 feet above the ground	8.1		
The greatest depression of the nocturnal radiation thermometer below the minimum air temperature	11.4	29th.	
Miles.			
The mean movement of the wind per day	63.4		
The greatest movement of the wind in one day	131.0	25th.	
The greatest movement of the wind in one hour	14.0	24th	10 to 11 and 11 to noon.
The number of hours with winds from each of the 8 points—			
N. 204, N.E. 44, E. 5, S.E. 4, S. 29, S.W. 130, W. 105, N.W. 114, Calm 109.			

The results of observations at the Alipore Observatory are not rigorously comparable with the registers of past years (at the Park Street Observatory). The barometer is about 3 feet higher at Alipore, and, other things being equal, reads therefore .003 lower. The diurnal range of temperature is also greater at Alipore, and the mean temperature apparently about 2.5° lower; and finally, the thermometer which furnished the record of temperature at the Surveyor-General's Office during 20 years and upwards is found to read 0.6 higher than the Kew standard thermometer, which is the standard of reference at the present Observatory.

C. LITTLE,

METEOROLOGICAL OFFICE, INDIA;
Calcutta, the 7th February 1890.

For Meteorological Reporter to the Govt. of India.

Meteorological Report of the Province

METEOROLOGICAL DIVISION	DISTRICT.	Representative station.	STATION OBSERVATIONS.														
			AIR PRESSURE.					TEMPERATURE.					HUMIDITY.		CLOUD.		
			Highest 8 A.M. barometer reading of month.	Lowest 8 A.M. barometer reading of month.	Mean 8 A.M. for month.	Mean reduced to sea-level.	Variation from normal mean.	Highest of month.	Lowest of month.	Mean daily maximum temperature.	Mean daily minimum temperature.	Mean daily temperature.	Variation from normal mean.	Mean 8 A.M. humidity.	Variation from normal mean.	Mean cloud amount, 8 A.M.	Variation from normal mean, 8 A.M.
			of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.	of month.
Central.	Pooree	Pooree	30.080	29.850	30.000	30.042	—	52.5	32.5	40.5	30.5	40.5	—	82	—	0.5	—
	Cuttack	Cuttack	30.045	29.705	30.015	30.034	—0.02	88.9	50.9	65.5	54.5	65.5	—1.5	73	—5	1.2	—0.2
	Balasore	Balasore	30.072	29.600	30.070	30.032	—0.04	85.4	40.4	60.4	44.4	60.4	+0.1	82	—	0.1	—
	South-West Midnapore and South 24-Pergunnahs.	Saugor Island	30.088	29.640	30.080	30.016	—0.07	81.7	41.7	56.0	40.4	56.0	+0.3	80	+2	0.0	—1.7
South-West Bengal.	Midnapore	Midnapore	29.004	29.705	30.000	30.025	—0.01	87.3	40.1	61.2	55.3	61.2	+1.8	73	—	0.4	—
	24-Pergunnahs, Howrah, and Hooghly.	Calcutta	30.091	29.845	30.090	30.015	—0.00	81.5	47.8	56.0	40.4	56.0	+0.0	87	+3	0.0	—1.3
	Burdwan	Burdwan	30.080	29.715	30.080	30.010	—0.03	85.3	40.7	60.0	55.0	60.0	+1.6	75	0	0.4	—1.3
	Bankura	Bankura	29.787	29.610	30.001	30.013	—0.07	86.0	43.2	59.1	51.9	59.1	+1.1	76	—	0.3	—
East Bengal.	West Burdwan and Beerbhoom.	Ranigunge	29.893	29.605	30.082	30.035	—0.05	85.5	40.7	59.6	55.2	59.6	+1.5	74	—	0.4	—
	Moorthadabad	Berhampore	30.050	29.775	30.000	30.000	—0.00	81.6	47.1	57.2	45.2	57.2	+1.2	82	+12	0.7	—1.0
	Nuddee	Krishnagar	30.050	29.824	30.007	30.037	—0.07	84.5	43.8	58.7	50.0	58.7	+2.0	86	—	0.8	—
	Jessore and Khoolna	Jessore	30.074	29.841	30.060	30.004	—0.05	81.7	48.4	58.1	52.5	58.1	+2.1	80	+10	1.2	—0.7
North Bengal.	Chittagong	Chittagong	30.097	29.815	30.011	30.000	—0.00	81.1	40.1	58.6	52.9	58.6	+1.5	80	+2	1.7	+0.1
	Chittagong Hill Tracts	Demagiri	30.011	29.885	30.000	30.002	—0.07	79.3	45.1	57.0	57.0	57.0	+2.5	80	—	0.0	—
	Backergunge	Barrisal	30.072	29.835	30.000	30.005	—	81.5	40.0	58.1	55.8	58.1	—	80	—	—	—
	Noakhally	Noakhally	30.004	29.810	30.070	30.012	—0.02	76.7	40.0	58.4	56.5	58.4	+1.1	80	—	0.8	—
North Bengal.	Purroodpore	Purroodpore	30.007	29.853	30.000	30.003	—0.00	81.1	48.2	59.5	56.0	59.5	+1.1	80	+7	1.2	—0.4
	Dacca	Dacca	30.071	29.841	30.077	30.014	—0.00	80.9	48.1	58.1	50.1	58.1	+2.0	87	—	0.0	—
	Tippurah	Cumilla	30.033	29.884	30.047	30.006	—0.00	77.9	45.8	57.1	57.4	57.1	+3.2	82	—	1.8	—
	Mymensingh	Mymensingh	30.011	29.800	30.020	30.007	—0.05	80.8	45.5	56.5	54.1	56.5	+0.1	80	—	0.5	—
North Bengal.	Boera	Boera	30.43	29.850	30.040	30.008	—0.00	81.4	47.9	57.1	53.5	57.1	+2.0	84	—	0.7	—
	Pabna	Pabna	30.007	29.751	30.000	30.005	—0.00	80.1	44.9	56.0	51.6	56.0	+3.4	86	—	0.2	—
	Rajshahy	Rajshahy	30.014	29.820	30.030	30.020	—	80.0	42.9	57.0	52.0	57.0	—	84	—	0.5	—
	Dinapore	Dinapore	29.894	29.71	30.000	30.007	—0.01	80.1	43.9	56.5	52.5	56.5	+1.8	87	—	1.5	—
North Bengal.	Hungpore	Hungpore	30.010	29.797	30.000	30.010	—0.07	80.0	41.2	56.1	52.4	56.1	+2.0	91	—	0.5	—
	Jalpigore and Cooch Behar.	Jalpigore	29.827	29.721	30.020	30.020	—0.00	81.0	44.0	57.1	53.0	57.1	—	91	—	1.0	—
	Darjeeling Hill Tracts	Darjeeling	29.031	29.701	30.031	30.031	—	83.9	39.1	58.4	55.7	58.4	+2.0	83	+0	5.7	+0.0
	Purneah and North Bhagulpore.	Purneah	30.016	29.780	30.002	30.017	—0.00	77.7	40.5	54.3	47.9	54.3	+0.9	92	+7	0.7	—0.7
North Bengal.	Mozufferpore	Mozufferpore	29.081	29.760	30.000	30.001	—0.05	78.9	43.8	55.5	51.2	55.5	+2.8	85	+3	0.8	—0.4
	Durbhunga	Durbhunga	29.010	29.691	30.000	30.001	—0.01	77.3	41.0	55.5	49.3	55.5	+1.0	87	—	1.2	—
	Chumprun	Chumprun	29.530	29.603	30.021	30.025	—0.02	76.5	40.1	55.0	48.1	55.0	+3.7	82	—	0.7	—
	Sarus	Chopra	29.781	29.515	30.011	30.001	—0.00	81.8	44.0	57.1	53.3	57.1	+3.0	75	—	0.4	—
North Bengal.	Shahabad	Shahabad	29.011	29.685	30.012	30.012	—0.05	81.4	41.0	56.0	50.5	56.0	+1.8	70	—	0.0	—
	Gya	Gya	29.000	29.671	30.000	30.000	—0.00	80.2	41.0	56.0	50.5	56.0	+2.7	82	—	1.0	—
	Banar	Banar	29.44	29.480	30.035	30.012	—0.00	80.6	47.0	57.1	52.8	57.1	+1.5	74	+0	0.9	—1.3
	South Bhagulpore and Monghyr.	Bhagulpore	29.000	29.600	30.015	30.015	—0.00	79.1	42.0	56.1	52.1	56.1	+2.3	81	—	0.0	—
North Bengal.	Sonthal Pergunnahs	Sonthal Pergunnahs	29.000	29.600	30.015	30.015	—0.00	79.1	42.0	56.1	52.1	56.1	+2.3	81	—	0.0	—
	Hazaribagh	Hazaribagh	29.000	29.600	30.015	30.015	—0.00	79.1	42.0	56.1	52.1	56.1	+2.3	81	—	0.0	—
	Chyabassan	Chyabassan	29.000	29.600	30.015	30.015	—0.00	79.1	42.0	56.1	52.1	56.1	+2.3	81	—	0.0	—
	Assam	Assam	29.000	29.600	30.015	30.015	—0.00	79.1	42.0	56.1	52.1	56.1	+2.3	81	—	0.0	—

* Means of 30 days.

+ 1.0

+ 2.0

+ 3.0

DISTRICT OBSERVATIONS.

DISTRICT OBSERVATIONS.										Representative stations.	DISTRICT.	UTTERAL GENERAL DIVISION.	
RAINFALL.													
Of month.					Since 18th May 1889.								
	Normal mean.	Variation from mean.	Number of rainy days.	Normal mean number of rainy days.	Mean of district.	Normal mean.	Variation.	Mean number of rainy days.	Normal mean number of rainy days.				
007	0.81	-0.21	0.8	1.0	74.98	85.83	+10.82	96.8	83.3	Poorce Gopulpore ... Palse Point ...	Poorce ...	CHINA.	
015	0.36	-0.21	0.8	1.0	66.30	61.98	+14.41	93.4	79.7	Cuttack ...	Cuttack ...		
007	0.44	-0.37	0.9	1.0	49.06	53.31	-3.55	83.3	77.2	Balasore ...	Balasore ...		
014	0.45	-0.20	0.7	1.1	58.57	62.37	-3.80	100.2	85.7	Saugor Island ...	South-West Midnapore and South 24-Pargannas.	SOUTH-WEST BENGAL.	
010	0.80	-0.40	0.7	1.2	66.30	61.57	-5.18	86.1	72.3	Midnapore ...	Midnapore ...		
073	0.80	+0.22	1.0	1.3	64.10	61.66	+2.44	92.1	80.3	Calcutta ...	24-Pargannas, Howrah, and Hooghly.		
006	0.39	-0.53	0.7	1.1	43.89	46.71	-2.82	81.2	75.9	Burdwan ...	Burdwan ...	SOUTH-WEST BENGAL.	
005	0.41	-0.50	0.6	1.3	55.83	52.28	+3.65	82.0	82.6	Bankura ...	Bankura ...		
001	0.45	-0.41	0.8	1.6	52.46	51.02	+0.84	85.0	81.9	Ranigunge ...	West Burdwan and Beerbhoom.		
002	0.45	-0.43	0.8	1.3	61.17	56.55	+0.63	82.1	79.3	Berhampore ...	Moorshedabad ...	SOUTH-WEST BENGAL.	
012	0.35	-0.23	0.8	1.1	61.61	49.14	+2.47	88.0	78.2	Krishnapore ...	Nuddes ...		
009	0.20	+0.80	1.4	1.3	54.75	63.22	+1.33	97.9	84.9	Jessore ...	Jessore and Khoulna ...		
053	0.70	-0.07	0.8	1.3	100.35	113.78	-13.43	111.3	107.9	Chittagong ...	Chittagong ...	SOUTH-WEST BENGAL.	
004	0.67	-0.03	0.5	1.4	65.77	81.60	-16.43	100.5	104.4	Demagiri ...	Chittagong Hill Tracts ...		
009	0.71	-0.12	2.0	1.3	74.41	77.01	+1.40	103.9	103.8	Barrisal ...	Backergunge ...		
013	0.10	-0.17	2.0	1.0	44.82	107.11	-16.29	111.5	105.1	Noakhully ...	Noakhully ...	SOUTH-WEST BENGAL.	
000	0.45	+1.45	2.0	1.3	62.27	63.72	+6.50	85.2	86.8	Furzedpore ...	Furzedpore ...		
000	0.42	-1.18	2.0	1.0	76.12	69.00	+10.30	107.0	91.3	Dacca ...	Dacca ...		
017	0.65	+0.62	2.0	1.4	54.62	69.31	-12.60	85.1	86.7	Comillah ...	Tipperah ...	SOUTH-WEST BENGAL.	
011	0.38	+0.77	1.0	1.2	88.78	67.31	+21.47	147.0	89.0	Mymensingh ...	Mymensingh ...		
000	0.37	+0.43	2.0	1.1	65.40	67.24	+8.58	103.7	77.8	Bogra ...	Bogra ...		
000	0.49	-0.10	1.5	1.4	53.37	61.35	+2.02	108.5	61.3	Serajunge ...	Pubna ...	SOUTH-WEST BENGAL.	
000	0.50	-0.62	0.7	1.0	54.55	63.85	+0.47	99.8	77.1	Rampore Beaulah ...	Rajshahye ...		
000	0.47	-0.67	0.0	1.6	39.76	54.22	-14.40	73.5	68.6	Maldah ...	Maldah ...		
012	0.38	-0.26	0.0	1.3	67.40	67.40	+0.00	83.3	78.2	Dinapore ...	Dinapore ...	SOUTH-WEST BENGAL.	
000	0.48	+0.23	2.3	0.9	85.47	73.81	+12.01	87.7	76.5	Rangpore ...	Rangpore ...		
000	0.40	+0.14	2.4	1.5	117.73	111.23	+6.48	105.4	97.1	Jalpigoree ...	Jalpigoree and Cooch Behar.		
070	0.68	-0.18	4.8	2.7	133.45	121.37	+12.08	127.6	113.7	Darjeeling ...	Darjeeling Hill Tracts.	SOUTH-WEST BENGAL.	
077	0.50	-0.21	0.0	1.8	75.00	68.69	+16.32	70.0	70.1	Purneah ...	Purneah and North Bhagulpore.		
017	0.66	-0.40	1.3	1.7	48.83	45.54	+6.29	71.1	67.8	Moufferpore ...	Moufferpore ...		
027	0.61	-0.37	1.3	1.4	52.11	44.72	+7.39	67.0	67.9	Durbhunga ...	Durbhunga ...	SOUTH-WEST BENGAL.	
041	0.67	-0.28	1.3	1.4	63.90	46.79	+17.17	66.0	64.2	Mothari ...	Chumparun ...		
000	0.67	-0.65	0.0	1.7	40.13	43.98	-2.85	68.4	67.8	Chupra ...	Sarun ...		
000	0.69	-0.09	0.0	2.0	40.07	40.08	-0.01	68.4	61.1	Dehree Buzar Arrah ...	Shahabad ...	SOUTH-BENGAL.	
000	0.63	-0.68	0.0	3.0	37.07	41.62	-4.55	63.8	67.8	Gya ...	Gya ...		
001	0.57	-1.67	0.0	1.8	48.49	41.33	+7.17	62.0	62.3	Bankipore ...	Patna ...		
000	0.6	-0.60	0.0	1.7	42.43	43.17	-0.74	60.4	60.3	Bhagulpore ...	South Bhagulpore and Moughya.	SOUTH-BENGAL.	
000	0.37	-0.37	0.0	1.1	64.15	50.79	+4.36	63.1	73.9	Naya Doonka ...	Sonthal Pargunnas ...		
000	0.60	-0.60	0.0	1.8	43.03	50.40	-7.43	63.8	61.2	Hasaribagh ...	Hasaribagh ...		
000	0.64	-0.64	0.0	2.6	44.04	49.13	-4.70	62.1	80.3	Ranchoo ...	Lohardugga ...	CHUTIA NAGPUR.	
000	0.43	-0.63	0.0	1.8	36.30	46.02	-8.08	97.1	84.0		Mandoom ...		Mandoom ...
000	0.73	-0.73	0.0	1.8	46.70	61.58	-9.82	100.0	92.3	Ohyebaza ...	Singbloom ...	SOUTH-BENGAL.	
										Shahganj ...	Assam ...		ASSAM.
										Shuhit ...			
										Silchar ...			

Table of Rainfall recorded at Stat

[illegible]

	28	29	30	31	Number of rainy days.	Average number of rainy days.	Total rainfall for the month.	Average rainfall for the month.	Heaviest rainfall during the month.	Total rainfall from 1st January 1899 up to 31st Jan. 1899.	Average rainfall from 1st January up to 31st January.	Station.	District.	Meteorological division.
...	1	0.04	0.04	0.26	0.04	0.04	0.26	Pooros Khurdah.	Pooros	Orissa.
...	Nil	1.3	Nil	0.07	Nil	Nil	0.07	Bampur.		
...	2	1.3	0.20	0.35	0.16	0.20	0.35	Faise Point.		
...	Nil	?	Nil	?	?	?	?	Gop.		
...	1	0.7	0.92	0.35	0.32	0.12	0.35	Jagatsingapore.	Cuttack.	
...	Nil	1.4	Nil	0.22	Nil	Nil	0.22	Hanki.		
...	Nil	1.3	Nil	0.44	Nil	Nil	0.44	Cuttack.		
...	1	0.7	0.21	0.44	0.41	0.21	0.44	Kendrapara.		
...	Nil	0.8	Nil	0.43	Nil	Nil	0.43	Jajpur.		
...	Nil	?	Nil	?	Nil	Nil	?	Dharmasole.		
...	Nil	?	Nil	?	Nil	Nil	?	Satipora.		
...	1	0.8	0.40	0.40	0.40	0.40	0.40	Chandbali.	Balasore	
...	Nil	0.8	Nil	0.39	Nil	Nil	0.39	Rhindruck.		
...	Nil	0.8	Nil	0.25	Nil	Nil	0.25	Sorah.		
...	Nil	0.9	Nil	0.75	Nil	Nil	0.75	Balasore.		
...	Nil	1.1	Nil	0.72	Nil	Nil	0.72	Jeliasore.		
...	Nil	1.3	Nil	0.16	Nil	Nil	0.16	Haripodah.		
...	1	0.8	0.65	0.31	0.35	0.05	0.31	Contai.	Midnapore.	South-West Bengal.
...	Nil	1.1	Nil	0.34	Nil	0.24	0.34	Sanger Island.		
...	Nil	0.8	0.20	0.35	0.24	0.20	0.35	Tumlook.		
...	Nil	1.4	Nil	0.72	Nil	0.72	0.72	Midnapore.		
...	1	1.4	0.11	0.31	0.11	0.11	0.31	Ghatol.		
...	1	?	0.19	?	0.19	?	0.19	Kukrahati.		
...	Nil	?	Nil	?	Nil	Nil	?	Thapansapore.		
...	Nil	?	Nil	0.80	Nil	Nil	0.80	Garbela.		
...	1	1.4	0.28	0.31	0.28	0.28	0.31	Diamond Har-	St-Pergumaha	
...	1	?	0.05	?	0.05	0.05	?	Bour.		
...	1	1.6	1.07	0.71	1.07	1.07	1.07	Canning Town.		
...	1	1.2	0.37	0.42	0.33	0.33	0.42	Alipore Jail.		
...	1	1.3	0.65	0.57	0.65	0.57	0.65	Barrackpore.		
...	1	1.2	1.10	0.56	1.10	1.10	1.10	Dum-Dum.		
...	1	0.9	1.49	0.42	1.49	1.49	0.42	Baranet.		
...	1	2.0	0.52	0.59	0.52	0.52	0.59	Buseerhat.		
...	1	0.8	0.40	0.40	0.40	0.40	0.40	Howrah.	Howrah.	
...	1	2.0	0.52	0.59	0.52	0.52	0.59	Mohesrcka (Colnoberiah).		
...	1	1.0	0.36	0.41	0.36	0.36	0.41	Seram-core	Hooghly.	
...	1	1.2	0.40	0.45	0.40	0.40	0.45	Hooguly.		
...	1	1.3	0.45	0.39	0.45	0.45	0.39	Jehanabad.		
...	Nil	0.9	Nil	0.36	Nil	Nil	0.36	C		

Table of Rainfall recorded at Station

[illegible]

Bengal in January 1890—continued.

	22	23	24	25	26	27	28	29	30	31	Number of rainy days.	Average number of rainy days.	Total rainfall for the month.	Average rainfall for the month.	Heaviest rainfall during the month.	Total rainfall from 1st January 1880 up to 31st Jan. 1890.	Average rainfall from 1st January up to 31st January.	Station.	District.	Meteorological division.
...	0.60	...	...	...	...	...	...	...	1	1.2	0.45	0.77	0.66	0.44	0.77	Patashally	Hackmunge.	East Bengal- concl.
...	...	0.45	...	...	...	...	...	...	...	...	1	1.1	0.48	0.71	0.53	0.45	0.71	Parashpore.		
...	...	0.50	...	...	...	...	...	...	...	...	1	1.4	0.52	0.60	0.50	0.50	0.50	Burrial.		
...	...	0.61	...	...	...	...	...	...	...	...	1	1.3	0.53	0.59	0.61	0.53	0.59	Rhola.		
...	...	0.23	...	...	...	...	...	...	...	...	1	1.2	0.45	0.77	0.66	0.44	0.77	Gournaddi.		
...	...	0.12	0.02	...	...	...	...	...	...	...	4	1.5	0.41	0.54	0.19	0.41	0.54	Banphal.		
...	...	0.20	...	...	...	...	...	...	...	...	1	1.5	0.45	0.79	0.45	0.45	0.79	Noakholly	Noakholly.	
...	...	0.30	...	...	...	...	...	...	...	...	1	1.4	0.40	0.70	0.30	0.40	0.70	Penny.		
...	Nil	...	Nil	...	Nil	...	...	Harishpore.		
...	1	1.3	0.41	0.51	0.13	0.41	0.51	Ramganj.		
...	...	1.13	...	...	...	...	...	...	...	...	3	1.3	0.41	0.51	0.13	0.41	0.51	Madaripore	Purroodpore.	
...	...	0.21	...	...	...	...	...	...	...	...	1	1.4	0.40	0.70	0.30	0.40	0.70	Purroodpore.		
...	1	1.3	0.41	0.51	0.13	0.41	0.51	Goalundo		
...	...	0.54	...	...	...	...	...	...	...	...	2	1.5	0.41	0.51	0.13	0.41	0.51	Munshigunge.	Dacca.	
...	...	2.50	...	...	...	...	...	...	...	...	1	1.3	0.41	0.51	0.13	0.41	0.51	Dacca.		
...	...	0.51	...	...	...	...	...	...	...	...	1	1.3	0.41	0.51	0.13	0.41	0.51	Naraingunge.		
...	...	1.17	...	...	...	...	...	...	...	...	1	1.3	0.41	0.51	0.13	0.41	0.51	Munshigunge		
...	...	0.75	...	...	...	...	...	...	...	...	1	1.3	0.41	0.51	0.13	0.41	0.51	Jaydeppore.		
...	...	0.12	...	...	...	...	...	...	...	...	2	1.4	0.50	0.83	0.18	0.30	0.43	Agartola	Hill Tipperah	
...	...	0.35	...	...	...	...	...	...	...	...	2	1.1	0.80	0.60	0.45	0.40	0.60	Comilla	Tipperah.	
...	...	0.40	...	...	...	...	...	...	...	...	1	1.1	0.75	0.65	0.40	0.40	0.65	Chandipore.		
...	...	1.25	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Bhanganabheria		
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Kanchandrapore.		
...	...	1.00	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Narainpore.		
...	...	0.09	...	...	...	...	...	...	...	...	Nil	...	Nil	...	Nil	...	...	Dumkandi.		
...	Nil	...	Nil	...	Nil	...	...	Asaba.		
...	Nil	...	Nil	...	Nil	...	...	Amsham.		
...	...	1.53	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Kishoregungo.	Myitthaingh.	
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Atm (Tangail).		
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Myitthaingh.		
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Jamulpore.		
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Notakona.		
...	...	0.30	...	...	...	...	...	...	...	...	Nil	...	Nil	...	Nil	...	...	Subarnakhal.		
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Durgapore.		
...	...	0.30	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Shorepore Town.		
...	...	0.41	...	...	...	...	...	...	...	...	1	1.0	0.74	0.77	0.25	0.44	0.77	Dacanganj.		
...	...	0.37	...	...	...	...	...	...	...	...	1	1.4	0.33	0.30	0.15	0.25	0.30	Pubna	Pubna	NORTH BHAR.
...	...	0.01	...	...	...	...	...	...	...	...	1	1.3	0.33	0.30	0.15	0.25	0.30	Serajgunce.		
...	...	0.11	...	...	...	...	...	...	...	...	1	1.2	0.40	0.35	0.20	0.30	0.35	Shorepore		
...	...	0.11	...	...	...	...	...	...	...	...	1	1.4	0.33	0.30	0.15	0.25	0.30	Nowkhilla.	Bogra.	
...	...	0.02	0.20	...	...	...	...	...	...	...	1	1.4	0.33	0.30	0.15	0.25	0.30	Bogra.		
...	1	1.0	0.41	0.51	0.13	0.41	0.51	Panobibi.		
...	1	1.0	0.41	0.51	0.13	0.41	0.51	Beaulah	Rajshahye.	
...	Nil	...	Nil	...	Nil	...	...	Nattore.		
...	Nil	...	Nil	...	Nil	...	...	Naogaon.		
...	Nil	...	Nil	...	Nil	...	...	Lalpara.		
...	Nil	...	Nil	...	Nil	...	...	Manda.		
...	Nil	...	Nil	...	Nil	...	...	Maldah	Maldah.	
...	Nil	...	Nil	...	Nil	...	...	Chanchal.		
...	Nil	...	Nil	...	Nil	...	...	Gajol.		
...	Nil	...	Nil	...	Nil	...	...	Sobganj.		
...	Nil	...	Nil	...	Nil	...	...	Mohadeppore.	Dinagore.	
...	Nil	...	Nil	...	Nil	...	...	Churaman.		
...	1	1.0	0.41	0.51	0.13	0.41	0.51	Bangore.		
...	...	0.01	...	...	...	...	...	...	...	...	1	1.0	0.41	0.51	0.13	0.41	0.51	Pinnagore.		
...	...	0.34	...	...	...	...	...	...	...	...	1	1.0	0.41	0.51	0.13	0.41	0.51	Bahadurhat.		
...	...	0.02	0.44	...	...	...	...	...	...	...	3	0.8	0.34	0.34	0.04	0.34	0.34	Thakurgaon.		
...	...	0.20	0.20	...	...	...	...	...	...	...	4	0.9	0.37	0.34	0.20	0.37	0.34	Bhawanigunge.	Rangpore.	
...	...	0.00	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Gyabanja.		
...	...	0.00	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Rangpore.		
...	...	0.10	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Kurigram.		
...	...	0.13	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Bandokra.		
...	...	0.0	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	(Niphama).		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Ulipore.		
...	...	0.13	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Julpore.	Julpore.	
...	...	0.01	...	...	...	...	...	...	...	...	Nil	...	Nil	...	Nil	...	...	Alipore Bar.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Falacotta.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Debaganj.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Bhogotpore.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	(Nagrakatta).		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Dinnatta.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Cooch Behar.	Cooch Behar.	
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Mickhanga.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Matabhanga.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Buxa.	Darjeeling.	
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Siliguri.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Darjeeling.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Kalimpong.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Kurseong.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Kissenkunge.	Purneah	NORTH BHAR.
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Arranoh.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Purneah.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Gondwara.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Balarampore.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Hatari.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Kaliganj.		
...	...	0.01	...	...	...	...	...	...	...	...	1	0.9	0.37	0.34	0.20	0.37	0.34	Madanpore.	North Bhagal- pore.	
...	...	0.01	...	...	...	...	...	...	...	...	1									

Table of Rainfall recorded at Station

Meteorological division.	District.	Station.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	
NORTH BENGAL — contd.	Durbhanga ..	Talpara ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Durbhanga ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Mathabari ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Barua ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Moulvibazar ..	Altamari ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Moulvibazar ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Naipore ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Para ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Chumpra ..	Makha ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Barua ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
SOUTH BENGAL	Gopalganj ..	Gopalganj ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Sowar ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Chapra ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Barua ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Shahabad ..	Buxar ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Dehri ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Bhuboah ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Sasaram ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Gya ..	Arrah ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Mohania ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna ..	Aurangabad ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Gya ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Nowadah ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jehanabad ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CENTRAL NAG- PUR.	Monghyr ..	Arrah ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Shahabad ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Patna ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Barua ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	South Bhagal- pore ..	Barua ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Barua ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Southal Par- gumohia ..	Rajmohal ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Ganda ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Patna ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Nya Dhamra ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
CENTRAL NAG- PUR.	Bazariab ..	Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bazariab ..	Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bazariab ..	Bazariab
		Bazariab
		Bazariab
		Bazariab
Bazariab ..	Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Bazariab ..	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

1	2	3	4	5	6	7	8	9	10	11	Number of rainy days.	Average number of rainy days.	Total rainfall for the month.	Average rainfall for the month.	Highest rainfall during the month.	Total rainfall from 1st January 1899 up to 31st Jan. 1899.	Average rainfall from 1st January up to 31st January.	Station.	District.	Meteorological division.
			0.13 0.28 0.41 0.06								1 1 NB Nil	1.4 1.4 ? ?	0.13 0.23 0.41 Nil	0.14 0.23 0.74 ?	0.14 0.23 Nil ?	0.13 0.23 Nil ?	0.13 0.23 0.74 ?	Tajpore Durbhunga. Madhubani. Bahera. Rohara.	Durbhunga ...	NORTH BENAR -concll.
			0.13 0.06 0.06 0.10								2 1 1 Nil Nil 2	1.2 1.7 2.1 ? ? ?	0.39 0.39 0.39 ? ? ?	0.39 0.39 0.39 ? ? ?	0.39 0.39 0.39 ? ? ?	0.39 0.39 0.39 ? ? ?	Sitamarhi Muzaffarpore Hajipore. Parsa. Jhapa. Sachir. Fapri.	Muzafferpore.		
			0.54 0.21 0.27								1 1 1 Nil	1.4 1.2 ? ?	0.54 0.29 0.37 Nil	0.54 0.29 0.37 Nil	0.54 0.29 0.37 Nil	0.54 0.29 0.37 Nil	0.54 0.29 0.37 Nil	Mothari Bodm. Bagaha. Barharwa.	Chamraria.	
											Nil Nil Nil Nil	1.4 2.2 1.7 ?	Nil Nil 0.71 ?	0.77 0.75 0.71 ?	Nil Nil Nil ?	Nil Nil Nil ?	0.77 0.75 0.71 ?	Gopalgunge- Rowan Chuprah.	Baran.	
											Nil Nil Nil Nil Nil	2.5 1.3 1.8 2.2 ?	Nil Nil Nil Nil ?	0.70 0.03 0.03 0.50 0.81	Nil Nil Nil Nil ?	Nil Nil Nil Nil ?	0.70 0.03 0.03 0.50 0.81	Roxar Dehase. Whubonah Severatn. Arrah. Mohaniah.	Shahabad	SOUTH BENAR.
											Nil Nil Nil Nil Nil Nil	1.8 2.4 1.6 2.1 ? ?	Nil Nil Nil Nil ? ?	0.61 0.13 0.70 0.72 ? ?	Nil Nil Nil Nil ? ?	Nil Nil Nil Nil ? ?	0.61 0.13 0.70 0.72 ? ?	Anrungabad .. Gya Nowad-h. Jehanabad. Arsool. Laudagar. Sheorghatti. Rayauli. Pakri Bara- wan.	Gya.	
											Nil Nil Nil Nil Nil	2.4 1.3 2.0 1.6 ?	Nil Nil Nil Nil ?	0.60 0.19 0.07 0.47 ?	Nil Nil Nil Nil ?	Nil Nil Nil Nil ?	0.60 0.19 0.07 0.47 ?	Patna Dimapore. Bohar. Barh. Bickram. Hilsa.	Patna.	
											Nil Nil Nil Nil Nil	1.4 1.0 1.6 ? ?	Nil Nil Nil ? ?	0.56 0.46 0.71 ? ?	Nil Nil Nil ? ?	Nil Nil Nil ? ?	0.56 0.46 0.71 ? ?	Begosera Monghyr. Jamui. Gogri. Sheikpara.	Monghyr.	
											Nil Nil Nil Nil	1.0 1.7 ? ?	Nil Nil ? ?	0.50 0.29 ? ?	Nil Nil ? ?	Nil Nil ? ?	0.50 0.29 ? ?	Bhazulpore .. Banka. Kolgong. Bangson.	South Bhagal- pore.	
											Nil Nil Nil Nil Nil	0.8 1.1 0.9 1.7 1.5 0.9 ? ?	Nil Nil Nil 0.02 0.43 0.43 ? ?	0.10 0.35 0.39 0.02 0.43 0.43 ? ?	Nil Nil Nil 0.02 0.43 0.43 ? ?	0.10 0.35 0.39 0.02 0.43 0.43 ? ?	0.10 0.35 0.39 0.02 0.43 0.43 ? ?	Rajagahal .. Gidda. Bakour. Nyn Toomka Dumkaur. Janitua. Holiapama. Nantah.	Sonthal Per- gunnahs	
											Nil Nil Nil Nil Nil Nil Nil	1.8 1.8 1.4 1.6 1.5 ? ? ?	Nil Nil Nil 0.40 ? ? ? ?	0.39 0.39 0.39 0.40 ? ? ? ?	Nil Nil Nil 0.40 ? ? ? ?	0.39 0.39 0.39 0.40 ? ? ? ?	0.39 0.39 0.39 0.40 ? ? ? ?	Pachamba ... (Girdi). Hazratbagh. Semtugurah. Mahudi Hilla. Jhoorah Hilla. Barhi. Chatra. Karagdeha. Ramghar.	Hazaribagh ..	CHOTIA NAAGPA.
											Nil Nil Nil Nil Nil Nil Nil	3.3 1.3 2.0 ? ? ? ?	Nil Nil Nil ? ? ? ?	0.84 0.79 0.77 ? ? ? ?	Nil Nil Nil ? ? ? ?	Nil Nil Nil ? ? ? ?	0.84 0.79 0.77 ? ? ? ?	Lohardugga... Ramon. Palamow. Silli. Bilawat. Hosainabad. Garwah. Chyabassa ... Chakradhar- pora.	Lohardugga.	
											Nil Nil Nil Nil Nil	1.8 ? ? ? ?	Nil ? ? ? ?	0.73 ? ? ? ?	Nil ? ? ? ?	Nil ? ? ? ?	0.73 ? ? ? ?	Chatsila. Baharagura.	Singbhoom.	
			0.00								1 Nil Nil Nil Nil	1.8 1.4 ? ? ?	0.00 Nil ? ? ?	0.00 0.01 ? ? ?	0.00 0.01 ? ? ?	0.00 0.01 ? ? ?	0.00 0.01 ? ? ?	Purnia ... Gabundpora. Roghunath- pora. Barabhoom. Jhatda. Chat.	Mainbhoom.	

**SUMMARY OF THE METEOROLOGICAL AND RAINFALL OBSERVATIONS
TAKEN IN BENGAL, AND OF THE METEOROLOGICAL OBSERVATIONS
TAKEN IN ASSAM, DURING THE MONTH OF JANUARY 1890.**

The normal meteorology of January in Bengal is very similar to that of the two previous cold-weather months, except that usually the cold weather conditions are more strongly developed in this month than in any other part of this season. Fairly strong northerly winds with practically cloudless skies, and with low temperature and humidity, rather high pressure, and an almost complete absence of rain obtain for the greater part of the month, unless these normal conditions are disturbed and almost reversed by the formation or appearance of barometric depressions over Northern India, which subsequently drift in a southerly or south-easterly direction through Central India and the North-West Provinces into Chutia Nagpur, Behar and Bengal. These disturbances give moist southerly and south-easterly winds to Bengal with heavily clouded skies and damp rainy weather, the day temperature remaining low, but the night temperature increasing largely. The heaviness of the rainfall brought up by these depressions varies considerably, but the rainfall is usually largest in Behar.

Practically the whole of the rainfall in January is brought about by these disturbances, and the amount is usually small, averaging from about a third of an inch in Orissa up to nearly two thirds of an inch in North Behar and Chutia Nagpur.

Meteorology of the month.—The chief features in the meteorology of January 1890 have been—

1. Pressure has been rather largely below the normal over the whole province, the defect usually ranging from six to eight-hundredths of an inch, and being comparatively small in the south of Orissa and largest in Western and Central Bengal.

2. The average temperatures for the month have been in excess of the normal in all districts, the excess being comparatively small in Orissa, where it is only about half a degree, while in the other districts and in Assam it varies from about one and-a-half to two and-a-half degrees.

3. Humidity has been above the normal by small amounts at almost all stations.

4. Cloud proportion has been below the normal at almost all stations in Bengal and considerably above it in Assam.

5. The number of barometric depressions from Northern India which have passed through Bengal during January have been small, and all except one have been of such feeble nature as to scarcely call for any record. A very slight disturbance passed apparently along the line of the hills to the north of the province, giving a few showers of rain in and near the hills on the 7th and 8th of January. A second, and also a very feeble, disturbance passed through South-West and East Bengal on the 19th and 20th of January, giving rather numerous showers in these two districts and a few showers in North Bengal. The third barometric depression which occurred near the end of the month was decidedly influential and of very much greater importance than the other two. It was first formed or was first noticed in North-Western India on the 22nd, and then travelled in a south-easterly direction, reaching Bengal on the 24th and 25th of January, and on the 26th it had advanced over Burma, giving heavy rain in its advance; and from this storm moderate rain was received in all districts except parts of North Bengal and North Behar, and except the whole of South Behar and Chutia Nagpur.

6. By these actions rainfall has been fairly abundant and considerably above the normal amount in East Bengal, of about the normal amount in South West Bengal and North Bengal, and decidedly deficient in North Behar. In Orissa the falls have been so small that rain may be said to have been practically absent, while in South Behar and Chutia Nagpur the rainfall has been entirely absent.

The weather conditions for the month therefore call for few explanatory remarks, for, except during the three brief periods mentioned in the fifth of the above clauses, weather has been generally of typical north-east monsoon character. Skies have therefore been generally almost cloudless during the greater part of the month, and rainfall has been entirely confined to a few showers during the periods of disturbance above mentioned. Owing to the comparative absence of rain and of the usual cold-weather storms in Upper India, temperature has been above the normal, and the northerly winds have been at certain times rather unsteady; the average humidity has also been rather high, owing perhaps to the fact that at one period of the month rather moist southerly winds set in for some days. During the last period of disturbance, and to a much smaller extent in the two smaller disturbances, the normal conditions became partially reversed, and skies clouded over, while the night temperatures rose very considerably.

Pressure—Was at the commencement of the month decidedly below the normal, and the average defect for about the first twenty days was from about five to eight-hundredths of an inch. With the depression which then passed through the province, this defect increased, and on the 24th and 25th pressure became from about a fifth to a quarter of an inch below the normal over a considerable part of the province. With the disappearance of the depression pressure rose rapidly, and by about the 27th and 28th of the month it had become very high, but before the close again it had commenced to fall. The average pressure for the whole month has therefore been decidedly in defect, the usual defect equalling about six to eight-hundredths of an inch. On the whole, the distribution of this defect of pressure has been fairly equal, but, if anything, the defects have been largest in the centre of the province, and least in such districts as Orissa, North Behar, and in parts of Assam such as at Sibsegor, &c.

Temperature—Continued generally decidedly above the normal up till the last week in January, when, under the influence of the rainfall in the plains, and with a moderate fall of snow along the Himalayas, a wave of cold northerly winds set in over the province, causing a very sudden reduction of temperature. So rapid was the fall that at many stations a decrease of 5°, and in some cases of even 9° and 10°, in the mean temperature of the day occurred on the 26th, and from this date to the end of the month very cool weather obtained. For the whole month consequently temperature was above the normal, the mean excess in Bengal equalling 1·8°. In Assam the excess temperature has been almost the same, and it there equals 1·7°.

The actual oscillations and variations of the temperature for the month from the normal are best shown in the following table, where the variations from the normal of the average maximum, minimum and mean temperatures at nine typical stations in different districts of the province are given week by week:—

STATIONS.	WEEK ENDING 10TH JANUARY 1890.			WEEK ENDING 17TH JANUARY 1890.			WEEK ENDING 24TH JANUARY 1890.			WEEK ENDING 31ST JANUARY 1890.		
	Variation of actual mean maximum temperature of week from normal mean.	Variation of actual mean minimum temperature of week from normal mean.	Variation of actual mean daily temperature of week from normal mean.	Variation of actual mean maximum temperature of week from normal mean.	Variation of actual mean minimum temperature of week from normal mean.	Variation of actual mean daily temperature of week from normal mean.	Variation of actual mean maximum temperature of week from normal mean.	Variation of actual mean minimum temperature of week from normal mean.	Variation of actual mean daily temperature of week from normal mean.	Variation of actual mean maximum temperature of week from normal mean.	Variation of actual mean minimum temperature of week from normal mean.	Variation of actual mean daily temperature of week from normal mean.
Cuttack ...	-1·6	-1·6	-1·3	-0·3	-0·9	-0·6	+1·1	+1·9	+1·5	-2·0	-4·8	-4·5
Calcutta ...	+0·8	+2·6	+1·6	+1·0	+0·9	+0·9	+2·3	+4·7	+3·4	-3·4	-3·8	-3·6
Dacca ...	+2·2	+3·6	+3·1	+0·0	+2·4	+1·6	+1·3	+3·1	+2·1	-5·0	-2·4	-2·7
Burdwan ...	+1·5	+3·2	+2·4	+2·2	+0·6	+1·0	+2·2	+4·6	+3·8	+1·0	-3·8	-1·0
Patna ...	+3·2	+4·4	+3·8	+3·4	+2·0	+2·0	+4·0	+6·1	+5·0	-0·4	-5·3	-1·9
Gya ...	+1·6	+1·4	+1·6	+3·0	+2·4	+2·8	+4·1	+2·8	+3·9	-2·4	-1·7	-2·0
Purneah ...	-0·2	+4·7	+2·3	+0·2	+2·6	+1·6	+0·4	+4·2	+2·5	-2·4	-4·6	-3·8
Nasiribagh ...	+1·3	+2·0	+1·9	+3·6	+1·7	+2·0	+4·8	+5·0	+5·2	-2·6	-5·0	-3·9
Darjeeling ...	+6·5	+2·0	+4·2	+8·9	+1·2	+4·8	+0·1	+1·7	+2·3	+10·5	-0·8	+4·4

Rainfall—On the whole, has been deficient in quantity; South Behar and Chutia Nagpur have been rainless, and Orissa almost so; while the falls in North Behar are little more than a third of the normal amount. In South-West and North Bengal the falls are practically normal, but in East Bengal they are nearly twice as large as usual. Even in South-West Bengal, though on the average a fair amount of rain has fallen, only a few districts have received good falls, and these are 24-Pergunnahs, Howrah, Mooghly, Jessore, and Khoolna. In East Bengal the districts receiving the largest fall have been Furreedpore, Dacca, Comillah, and Mymensingh; and in North Bengal the falls have been practically confined to the districts of Bogra, Rungpore, Julpigoree, Cooch Behar, Darjeeling Hills, and Pubna.

The following table gives the summary of the temperature and rainfall data of each of the seven meteorological divisions of the province for the month of January 1890:—

METEOROLOGICAL DIVISIONS.	TEMPERATURE.						RAINFALL.					
	Highest observed during month.		Lowest observed during month.		Averages for month.		Of month.		Rainy days.		Since 16th May 1889.	
	Of highest of day.	At lowest of day.	Of highest of day.	At lowest of day.	Of mean for each day.	Average mean of month above or below normal mean of month.	Average.	Normal average.	Variation.	Average number in month.	Normal average number in month.	Variation.
Orissa ...	86·9	46·9	80·8	35·4	60·6	+0·6	0·00	0·38	-0·29	0·4	1·0	-0·6
South-West Bengal ...	87·3	48·8	78·6	36·1	67·3	+1·4	0·44	0·45	-0·01	0·8	1·2	0·4
East Bengal ...	81·3	46·0	77·0	36·8	66·9	+2·1	1·08	0·56	+0·47	1·8	1·4	+0·4
North Bengal ...	81·4	37·9	76·7	33·2	60·0	+2·0	0·42	0·43	-0·01	1·4	1·8	+0·2
North Behar ...	79·3	40·6	74·9	31·4	63·3	+2·3	0·23	0·00	-0·37	0·9	1·5	-0·6
South Behar ...	82·6	41·9	70·4	31·8	64·1	+3·4	Nil	0·56	-0·60	0·0	1·7	-1·7
Chutia Nagpur ...	82·0	37·9	74·3	30·0	62·6	+2·6	Nil	0·66	-0·60	0·0	1·9	-1·9
Assam ...	83·8	46·1	74·0	34·7	64·3	+1·7						

* Pooree, Julpigoree and Chyebassa not included.

METEOROLOGICAL OFFICE, BENGAL,
The 11th February 1890.

A. PEDLER,
Meteorological Reporter to the Govt. of Bengal.

Meteorological Report of the Province of Bengal

			STATION OBSERVATIONS.													
METEOROLOGICAL DIVISION.	DISTRICT.	Representative station.	AIR PRESSURE.			WIND.		TEMPERATURE.							Mean of 10 years.	
			Mean barometric height, s. m.	Mean reduced to sea-level.	Variation from mean.	Prevailing direction.	Mean wind velocity.	Highest during week.	Date.	Lowest during week.	Date.	Mean maximum temperature.	Mean minimum temperature of week.	Mean daily temperature of week.		Variation from normal mean of week.
WEST BENGAL.	Pooree	Pooree	30.083	30.083	—	Calm	50	81.6	2, 6, 7 Feb.	86.0	1, 3 Feb.	81.2	81.7	71.2	—	82.1
	Gopalpore	Gopalpore	30.071	30.067	—0.004	NW	23.5	79.7	6th	80.0	1st	78.8	82.0	70.4	—2.8	87.2
		Paper Point	30.083	30.105	+0.022	NW	137	80.9	6th	80.6	1st	79.3	86.2	67.8	—3.3	81.2
	Cuttack	Cuttack	30.029	30.114	+0.089	Calm	21	87.9	7th	83.9	1st	85.3	80.2	72.6	—1.8	83.1
	Balasore	Balasore	30.052	30.114	+0.062	NNW	79.3	87.4	6th	86.4	1st	81.0	83.3	67.2	—2.4	84.1
	South-West Midnapore	Saugor Island	30.084	30.111	+0.027	NNW & NE	178.0	75.3	2nd	85.3	2nd	76.8	87.8	67.3	—3.5	86.1
	South 24-Pergunnahs	Midnapore	29.058	30.118	+0.060	N	21.1	84.3	6th	81.2	1st, 3rd	82.0	83.9	65.0	—0.8	80.1
	24-Pergunnahs	Calcutta	30.090	30.113	+0.023	Calm	21.0	78.5	8th	81.8	1st	77.3	83.2	66.3	—2.4	82.0
	Howrah	Howrah	30.068	30.111	+0.043	Calm	22.7	81.0	7th	84.3	3rd & 4th Feb.	79.7	84.6	65.0	—2.6	82.1
	Hooghly	Hooghly	30.068	30.111	+0.043	Calm & W	28.0	80.9	6th	80.3	2nd	80.1	81.7	63.8	—1.7	81.1
NORTH-WEST BENGAL.	Burdwan	Burdwan	30.088	30.138	+0.050	WNW	46.4	81.7	6th, 8th	80.2	1st, 3rd	80.8	81.1	65.9	—1.4	80.1
	West Burdwan	Berhampur	30.030	30.111	+0.081	WSW	39.1	78.6	8th & 7th Feb.	87.0	6th	77.6	80.4	63.3	—2.7	84.1
	Moohadedab	Krishnachur	30.062	30.133	+0.071	NNW	29.2	79.8	6th, 7th	84.9	7th	79.8	84.9	63.0	—3.6	81.1
	Nudda	Nudda	30.073	30.148	+0.075	Calm	23.8	78.3	7th	80.9	7th	77.6	81.9	64.5	—2.2	82.1
	Jessore	Jessore	29.091	30.087	+0.096	NW	61.0	81.1	1st, 2nd	81.2	7th	80.4	82.0	66.4	—1.1	82.1
	Khoolna	Chittagong	29.091	30.087	+0.096	NW	61.0	81.1	1st, 2nd	81.2	7th	80.4	82.0	66.4	—1.1	82.1
	Chittagong	Chittagong	29.091	30.087	+0.096	NW	61.0	81.1	1st, 2nd	81.2	7th	80.4	82.0	66.4	—1.1	82.1
	Chittagong Hill Tracts	Demagiri	30.074	30.097	+0.023	Northerly	35.3	77.3	6th, 7th Feb.	80.1	7th	76.7	82.0	61.4	—2.6	80.1
	Barisal	Barisal	30.053	30.101	+0.048	N	63.7	79.0	1st, 2nd, 6th Feb.	87.0	6th, 7th	78.4	84.4	63.4	—	80.1
	Noakhali	Noakhali	30.068	30.110	+0.042	Calm & N	44.0	78.0	1st & 3rd Feb.	80.5	6th, 7th	78.7	81.0	62.4	—2.0	80.1
SOUTH BENGAL.	Faridpore	Faridpore	30.061	30.083	+0.022	Northerly	50.2	80.1	1st	80.2	7th	78.1	80.7	64.4	—2.0	80.1
	Dacca	Dacca	30.076	30.107	+0.031	NW	21.8	80.4	1st	80.1	6th	78.7	80.8	64.7	—1.4	80.1
	Tipperah	Commillah	30.037	30.077	+0.040	W	36.1	78.3	7th	87.0	2nd, 3rd	77.3	80.2	62.8	—0.9	80.1
	Mymensingh	Mymensingh	30.040	30.095	+0.055	Westerly	18.0	78.3	7th	80.0	1st	77.7	80.5	62.6	—1.4	80.1
	Bogra	Bogra	30.030	30.104	+0.074	N	63.7	77.9	1st	80.8	6th	76.4	84.1	61.0	—	80.1
	Soragunge	Soragunge	30.040	30.095	+0.055	Westerly	18.0	78.3	7th	80.0	1st	77.7	80.5	62.6	—1.4	80.1
	Majshabye	Lampore Head	30.030	30.104	+0.074	N	63.7	77.9	1st	80.8	6th	76.4	84.1	61.0	—	80.1
	Maldah	Maldah	30.042	30.129	+0.087	NW	61.3	78.6	7th	82.7	6th	78.4	84.1	61.0	—	80.1
	Dinapore	Dinapore	29.073	30.103	+0.030	W	28.0	78.1	1st & 7th Feb.	84.8	6th	77.2	80.1	61.7	—0.6	80.1
	Rangpore	Rangpore	29.078	30.114	+0.036	Calm & E	17.0	77.8	7th	84.0	2nd	76.7	80.3	61.0	+0.0	80.1
NORTH BENGAL.	Jalpaiguri	Jalpaiguri	29.062	30.101	+0.039	N	48.1	?	?	80.0	2nd	?	80.1	?	?	?
	Cooch Behar	Cooch Behar	29.062	30.101	+0.039	N	48.1	?	?	80.0	2nd	?	80.1	?	?	?
	Darjeeling Hill Tracts	Darjeeling	29.090	—	—	SE	63.8	83.6	6th—7th Feb.	83.0	4th	83.0	84.8	64.1	+2.0	80.1
	Purneah	Purneah	29.075	30.114	+0.039	Westerly	44.4	78.7	7th	82.0	6th	78.5	83.0	59.1	—5.7	80.1
	North Bhagulpore	North Bhagulpore	29.075	30.114	+0.039	Westerly	44.4	78.7	7th	82.0	6th	78.5	83.0	59.1	—5.7	80.1
	Mooserpore	Mooserpore	29.075	30.114	+0.039	Westerly	44.4	78.7	7th	82.0	6th	78.5	83.0	59.1	—5.7	80.1
	Darbhanga	Darbhanga	29.075	30.114	+0.039	Westerly	44.4	78.7	7th	82.0	6th	78.5	83.0	59.1	—5.7	80.1
	Chumparan	Mothari	29.075	30.123	+0.078	SW	39.9	78.2	7th	81.0	6th	76.1	80.6	60.8	—1.4	80.1
	Baran	Chupra	29.075	30.123	+0.078	SW	39.9	78.2	7th	81.0	6th	76.1	80.6	60.8	—1.4	80.1
	Shahabad	Shahabad	29.075	30.123	+0.078	SW	39.9	78.2	7th	81.0	6th	76.1	80.6	60.8	—1.4	80.1
SOUTH BENGAL.	Gya	Gya	29.074	30.100	+0.026	S	103.8	79.5	7th	80.0	6th	77.8	81.8	61.7	—0.1	80.1
	Patna	Patna	29.031	30.123	+0.092	SW	37.4	78.9	6th	80.4	2nd	76.1	80.6	60.8	—1.4	80.1
	South Bhagulpore	Bhagulpore	29.036	30.110	+0.074	Calm	10.0	78.1	6th	83.0	6th	76.9	80.3	61.1	—1.9	80.1
	North Bhagulpore	Bhagulpore	29.036	30.110	+0.074	Calm	10.0	78.1	6th	83.0	6th	76.9	80.3	61.1	—1.9	80.1
	Bohara	Bohara	29.044	30.132	+0.088	NW	37.0	79.4	7th	80.0	6th	77.4	80.3	60.0	—	80.1
	Barh	Barh	29.048	30.140	+0.092	Westerly	140.4	78.9	7th	80.6	1st, 2nd	75.7	80.8	60.7	—0.3	80.1
	Barh	Barh	29.048	30.140	+0.092	Westerly	140.4	78.9	7th	80.6	1st, 2nd	75.7	80.8	60.7	—0.3	80.1
	Barh	Barh	29.048	30.140	+0.092	Westerly	140.4	78.9	7th	80.6	1st, 2nd	75.7	80.8	60.7	—0.3	80.1
	Barh	Barh	29.048	30.140	+0.092	Westerly	140.4	78.9	7th	80.6	1st, 2nd	75.7	80.8	60.7	—0.3	80.1
	Barh	Barh	29.048	30.140	+0.092	Westerly	140.4	78.9	7th	80.6	1st, 2nd	75.7	80.8	60.7	—0.3	80.1

* Means of six days.

Explanation.—Summary.—The normal means of air pressure and temperature are the arithmetic averages or means of the readings during the same period for the years 1871-80. The normal means of air pressure are expressed in millibars, and the normal means of temperature in degrees Fahrenheit. A rainy day is denoted by a dot and a half (·½) after the normal means of the rainfall in that district determined from the returns sent to the Meteorological Department for the period in question during the year. The rainfall is the sum of the returns divided by the number of stations. A rainy day is one on which at least hundredth of an inch fell.

for the week ending Friday, the 7th of February 1890.

DISTRICT OBSERVATIONS.															Representative station.	District.	Meteorological Division.
Average at 9 A.M.	Average cloud amount at 9 A.M. for week.	Rainfall of week at observing station.	OF WEEK.		RAINFALL.						Average number of rainy days.	Normal number of rainy days.					
			Mean for district.	Normal mean.	Since 1st of month.			Since 15th May 1889.									
					Mean for district.	Normal mean.	Variation.	Mean for district.	Normal mean.	Variation.							
63	0.0	Nil	Nil	0.15	Nil	0.15	-0.15	76.94	86.78	+19.84	0.0	0.3	Poorce	Poorce	Orissa.		
64	0.3	Nil	Nil	0.21	Nil	0.21	-0.21	66.39	83.19	+16.80	0.0	0.4	Outlack	Outlack			
65	0.4	Nil	Nil	0.38	Nil	0.33	-0.33	46.94	53.66	-6.72	0.0	0.4	Balnore	Balnore			
66	0	Nil	Nil	0.57	Nil	0.57	-0.57	58.61	63.94	-5.33	0.0	0.7	Langor Island	South-West Midnapore			
67	0	Nil	Nil	0.43	Nil	0.44	-0.43	46.33	86.00	-39.67	0.0	0.5	Midnapore	Midnapore	South 24-Pergunnahs.		
68	0	Nil	Nil	0.61	Nil	0.61	-0.61	51.15	83.17	-32.02	0.0	0.7	Calcutta	24-Pergunnahs.			
69	0	Nil	Nil	0.42	Nil	0.43	-0.42	41.80	47.13	-5.33	0.0	0.7	Bardwan	Howrah			
70	0	Nil	Nil	0.12	Nil	0.12	-0.12	53.91	63.40	-9.49	0.0	0.5	Bankura	Hooghly			
71	0	Nil	Nil	0.30	Nil	0.30	-0.30	63.46	61.93	+1.53	0.0	0.5	Bankura	West Bardwan	South-West Bengal.		
72	0	Nil	Nil	0.26	Nil	0.28	-0.26	61.71	60.83	+0.88	0.0	0.6	Bankura	West Bardwan			
73	0	Nil	Nil	0.35	Nil	0.38	-0.35	61.61	49.62	+11.99	0.0	0.6	Bankura	Moorshedabad			
74	0	Nil	Nil	0.39	Nil	0.39	-0.39	64.73	63.61	+1.12	0.0	0.6	Bankura	Nuddea			
75	0	Nil	Nil	0.12	Nil	0.12	-0.12	100.25	115.09	-14.84	0.0	0.6	Chittagong	Jessore	South-West Bengal.		
76	0	Nil	Nil	0.19	Nil	0.19	-0.19	63.17	61.79	+1.38	0.0	0.6	Chittagong	Khoolna			
77	0	Nil	Nil	0.30	Nil	0.30	-0.30	76.41	77.31	-0.90	0.0	0.6	Chittagong	Chittagong Hill Tract			
78	0	Nil	Nil	0.30	Nil	0.30	-0.30	90.82	107.64	-16.82	0.0	0.6	Chittagong	Backergunge			
79	0	Nil	Nil	0.37	Nil	0.37	-0.37	62.82	66.69	-3.87	0.0	0.6	Chittagong	Noakhully	South-West Bengal.		
80	0	Nil	Nil	0.35	Nil	0.35	-0.35	76.19	69.76	+6.43	0.0	0.6	Chittagong	Purboodpore			
81	0	Nil	Nil	0.23	Nil	0.23	-0.23	61.63	60.81	+0.82	0.0	0.6	Chittagong	Dacca			
82	0	Nil	Nil	0.23	Nil	0.23	-0.23	60.78	61.67	-0.89	0.0	0.6	Chittagong	Committah			
83	0.1	Nil	Nil	0.34	Nil	0.36	-0.34	60.78	61.67	-0.89	0.0	0.6	Chittagong	Mymensingh	South-West Bengal.		
84	0	Nil	Nil	0.19	Nil	0.19	-0.19	63.73	67.43	-3.70	0.0	0.6	Chittagong	Bogra			
85	0	Nil	Nil	0.30	Nil	0.30	-0.30	63.87	63.63	+0.24	0.0	0.6	Chittagong	Bogra			
86	0	Nil	Nil	0.31	Nil	0.31	-0.31	66.33	64.11	+2.22	0.0	0.6	Chittagong	Serajpore			
87	0	Nil	Nil	0.16	Nil	0.16	-0.16	39.79	54.40	-14.61	0.0	0.6	Chittagong	Rampore	South-West Bengal.		
88	0	Nil	Nil	0.06	Nil	0.06	-0.06	67.40	57.46	+9.94	0.0	0.6	Chittagong	Rajshahye			
89	0	Nil	Nil	0.00	Nil	0.00	-0.00	68.67	73.60	-4.93	0.0	0.6	Chittagong	Maldah			
90	0	Nil	Nil	0.03	Nil	0.03	-0.03	117.73	111.73	+6.00	0.0	0.6	Chittagong	Dinapore			
91	2.3	Nil	Nil	0.12	Nil	0.12	-0.12	131.46	121.40	+10.06	0.0	0.6	Chittagong	Chittagong	South-West Bengal.		
92	0	Nil	Nil	0.12	Nil	0.12	-0.12	76.06	68.00	+8.06	0.0	0.6	Chittagong	Chittagong			
93	0	Nil	Nil	0.11	Nil	0.11	-0.11	48.83	43.66	+5.17	0.0	0.6	Chittagong	Chittagong			
94	0.1	Nil	Nil	0.11	Nil	0.11	-0.11	67.31	44.83	+22.48	0.0	0.6	Chittagong	Chittagong			
95	1.4	Nil	Nil	0.13	Nil	0.13	-0.13	63.06	46.02	+17.04	0.0	0.6	Chittagong	Chittagong	South-West Bengal.		
96	0	Nil	Nil	0.06	Nil	0.06	-0.06	40.13	43.04	-2.91	0.0	0.6	Chittagong	Chittagong			
97	0	Nil	Nil	0.14	Nil	0.14	-0.14	60.97	40.33	+20.64	0.0	0.6	Chittagong	Chittagong			
98	0	Nil	Nil	0.18	Nil	0.18	-0.18	37.07	41.80	-4.73	0.0	0.6	Chittagong	Chittagong			
99	0.4	Nil	Nil	0.19	Nil	0.19	-0.19	43.19	41.51	+1.68	0.0	0.6	Chittagong	Chittagong	South-West Bengal.		
100	0	Nil	Nil	0.18	Nil	0.18	-0.18	42.43	43.33	-0.90	0.0	0.6	Chittagong	Chittagong			
101	0	Nil	Nil	0.22	Nil	0.22	-0.22	51.13	61.01	-9.88	0.0	0.6	Chittagong	Chittagong			
102	0	Nil	Nil	0.13	Nil	0.13	-0.13	41.63	50.66	-9.03	0.0	0.6	Chittagong	Chittagong			
103	0	Nil	Nil	0.23	Nil	0.23	-0.23	44.14	40.30	+3.84	0.0	0.6	Chittagong	Chittagong	South-West Bengal.		
104	0	Nil	Nil	0.24	Nil	0.24	-0.24	38.30	41.30	-3.00	0.0	0.6	Chittagong	Chittagong			
105	0	Nil	Nil	0.37	Nil	0.37	-0.37	48.70	61.93	-13.23	0.0	0.6	Chittagong	Chittagong			
106	0	Nil	Nil	0.37	Nil	0.37	-0.37	48.70	61.93	-13.23	0.0	0.6	Chittagong	Chittagong			

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 7th of February 1890.

Meteorological division.	District.	Station.	RAINFALL.							Total		Total rain-fall since 1st of month.	Average total rain-fall from 1st of month.	Total rain-fall since 10th May 1889.	Average rainfall from 10th May to date.
			Saturday, 1st February.	Sunday, 2nd February.	Monday, 3rd February.	Tuesday, 4th February.	Wednesday, 5th February.	Thursday, 6th February.	Friday, 7th February.	Number of rainy days.	of Rainfall in inch.				
Ganges	Pooree	Pooree	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.21	84.71	81.70
		Ahmedah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.18	76.57	85.00
		Rampur	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	NH	65.00	60.00
		Faua Point	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.23	77.00	65.10
		Ger	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
	Outback	Papla	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Jagatsingpore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.06	74.40	67.10
		Barki	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.18	81.45	69.00
		Outback	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.30	70.18	60.00
		Kendrapara	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.14	72.24	63.40
South-West Bengal.	Balesore	Jajpore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.01	87.64	83.00
		Sharmasole	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	80.25	?
		Salspore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	72.67	?
		Chandail	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.31	85.06	85.70
		Bhuddrach	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.04	77.06	82.30
	Midnapore	Narah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.20	40.01	80.00
		Balesore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.40	39.00	84.30
		Joinsore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.10	84.70	83.00
		Haripedah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Contai	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.58	85.18	61.00
24-Pargunahs	Diamond Har-	Sunder Island	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.67	80.74	67.00
		Jumook	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.03	40.00	61.00
		Midnapore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.29	43.30	61.00
		Ghetul	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	80.81	?
		Kukurahaty	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	61.72	?
	Howrah	Bhowanipore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	66.29	?
		Diamond Har-	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.85	63.70	80.00
		bour	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	87.81	?
		Canning Town	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.40	81.87	84.30
		Alipore Jail	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.74	82.12	80.00
Hooghly	Hooghly	Barackpore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.44	85.43	82.10
		Dum-Dum	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.04	88.71	80.00
		Harriet	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.20	82.61	81.00
		Basorhat	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.38	80.64	81.00
		Howrah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.34	85.04	84.00
	Serampore	Mohoreka	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		(Oolobernah.)	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.03	85.61	84.70
		Serampore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.64	37.03	40.00
		Hooghly	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.80	61.61	83.00
		Johannabad	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
Burdwan	Burdwan	Culina	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.41	61.23	64.70
		Burdwan	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.57	67.03	60.10
		Culina	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.66	65.11	60.00
		Banaranga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.37	85.90	80.00
		Barbar	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	83.00	?
	Banksia	Hankore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.03	80.00	81.00
		Hishore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.00	87.00	83.00
		Mahara	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.11	85.01	84.00
		Khatra	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.03	45.14	?
		Indas	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	40.40	?
Bourbom	Bourbom	Kotalpore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	40.44	?
		Anda	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	80.17	?
		Trangajalghat	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	80.05	?
		Kaipore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	84.64	?
		vonamahi	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
	Bourbom	Mh. Soory	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.44	80.00	84.10
		Histampore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.30	47.07	84.00
		Rampore Han	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.23	47.78	81.77
		Rampore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	85.04	?
		Murari	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	83.10	?
Mudde	Mudde	Ranaghat	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.37	80.10	87.00
		Kalimachor	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.06	49.05	60.00
		Chandanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.38	40.00	81.37
		Mohoreka	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.74	82.15	67.00
		Konshim	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.30	80.00	84.77
	Khoolia	Sathhira	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.06	61.64	83.00
		Bachhat	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.47	85.45	81.00
		Khoolia	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.36	60.84	85.17
		Nakpur	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Kawpal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
Jessore	Jessore	Sarail	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.34	80.01	80.00
		Jessore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.37	87.00	84.70
		Jhmdah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.00	80.74	83.70
		Banarab	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.54	80.00	80.00
		Bougang	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.47	67.00	81.00
	Moordhabad	Kandi	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.18	81.34	81.00
		Hishampore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.00	80.20	81.00
		Laibag	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.20	67.15	80.00
		Asimanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.06	80.00	81.00
		Jung, ore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.05	85.01	80.00
S. Bengal.	Chittagong	Langola	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	41.20	?
		Jangra	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	43.00	?
		Abdus	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Pakubari	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Chittagong	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.00	123.00	100.00
	Chittagong Hill Tracts.	Chittagong	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.10	77.00	84.00
		Katubdia	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	113.00	?
		Bathanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	60.00	?
		Rangamati	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.26	63.13	80.00
		Kuma	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.12	67.00	80.00
Hockhanga	Hockhanga	Patankhally	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.14	87.00	80.00
		Pompanore	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.41	73.04	80.00
		Burman	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.50	75.01	80.00
		Boola	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.14	80.00	80.00
		Hockhanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
	Hockhanga	Hockhanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Hockhanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Hockhanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Hockhanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?
		Hockhanga	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	?

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 7th of February 1890—contd.

Division.	District.	Station.	RAINFALL.							TOTAL		Total rain- fall since 1st of month.	Average total rain- fall from 1st of month.	Total rain- fall since 15th May 1889.	Average rainfall from 15th May to date.
			Sunday, 1st February 1890.	Sunday, 2nd February.	Monday, 3rd February.	Tuesday, 4th February.	Wednesday, 5th February.	Thursday, 6th February.	Friday, 7th February.	Number of rainy days.	Rainfall in inch.				
BENGAL NORTH.	Noakholly	Gourmaddi	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	61.31	?	
		Barphai	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	53.13	?	
		Southolly	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	102.59	108.09		
		Panir	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	79.03	107.07		
	Farrukhpoore	Harishpore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	81.32	?	
		Ramganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	86.75	?	
	Dacca	Madani-pore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	62.39	10.83	
		Farrukhpoore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.31	65.09	80.61	
		Gonimunde	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.49	89.91	88.48	
		Munshingunge	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.42	77.51	70.50	
	Hill Tipperah	Dacca	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.31	75.43	58.09	
		Narainpore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.41	61.14	60.19	
Manichhanga		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	69.71	80.25		
Jogdabpore		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	65.55	?		
Agartola		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.29	44.58	61.76		
Comilla		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	62.07	70.90		
Chandpore		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.22	65.97	75.01		
Brahmanbaria		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.24	53.11	61.94		
Kamachandrapore.		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	60.52	?		
Kasirnagar		Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	22.39	?		
BENGAL CENTRAL.	Mymensingh	Bandhkhanda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	63.74	?	
		Kasba	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	62.44	?	
		Lokham	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	69.49	?	
		Kishoreganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	70.70	70.70	
	Fahra	Atia (Touga)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.30	61.60	65.78	
		Nemaitan	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.31	97.95	74.57	
		Jamipore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.31	100.01	64.53	
		Satkhari	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.10	126.67	73.06	
	Bogra	Subarnachal	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	57.43	?	
		Pargana	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	150.25	?	
		Chorepore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	98.17	?	
		Thakurgaon	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	57.08	?	
Bogra	Punia	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.31	50.20	53.96		
	Serganjan	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.29	60.51	55.16		
	Chorepore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.09	62.07	57.51		
	Nowkhilla	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.07	62.44	54.37		
Rajshahye	Boga	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.4	71.33	61.00		
	Panchabhi	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.17	65.98	53.30		
	Nowleh	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.37	66.34	55.29		
	Natore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.29	58.81	55.23		
Maidah	Nangon	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.01	67.87	51.45		
	Lalpur	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	30.72	?		
	Manda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	45.27	?		
	Maidah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.17	60.55	51.30		
Dumkani	Chanchal	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.19	59.95	55.90		
	Gopal	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	59.75	?		
	Siapanj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	61.77	?		
	Mohadepore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.08	53.63	50.41		
Rangpur	Churaman	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	51.47	?		
	Majumdar	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.04	52.37	57.57		
	Dumkani	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.3	68.23	65.57		
	Balochan	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.10	61.29	61.03		
Jalpaiguri	Thakurgaon	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	57.81	?		
	Manichhanga	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.08	58.30	61.74		
	Gyandab	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.08	74.94	74.63		
	Kamachandrapore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.03	61.62	73.37		
Dumkani	Bagmura	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.10	65.40	55.30		
	Nalbamari	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	70.10	?		
	Ulipore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	70.10	?		
	Jalpaiguri	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.05	153.43	112.06		
Cooch Behar	Alipore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	110.08	?		
	Duoi	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	128.25	?		
	Pallikatta	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	130.04	?		
	Dehri	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	130.22	?		
Darjeeling Hill.	Rhagatpore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	130.22	?		
	(Naurakutta).	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	130.22	?		
	Chikla	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.07	60.83	50.50		
	Lachen Behar	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	128.25	?		
Purneah	Michiganpore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.14	102.59	108.09		
	Manichhanga	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	110.08	111.64		
	Dumkani	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.14	102.59	108.09		
	Silghari	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.02	121.08	105.43		
North Bhagulpore.	Tarapur	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	128.25	108.09		
	Kolung ng	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.10	60.18	50.07		
	Kureoung	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	170.90	?		
	Kureoung	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.09	105.07	70.53		
Dumkani	Arrah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.16	70.55	63.04		
	Purneah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.14	63.47	61.74		
	Gondwara	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Kaliampong	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Arrah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Arrahganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.11	60.85	60.30		
	Madhupore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.19	67.26	68.37		
	Seemul	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	65.16	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
	Prasebganj	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?		
Dumkani	Prasebganj</														

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 7th of February 1890—contd.

Meteorological Division.	District.	Station.	Rainfall.							Total.		Total rainfall since 1st of month.	Average rainfall from 1st of month.	Total rainfall since 15th May 1889.	Average rainfall from 1st of month.
			Saturday, 1st February.	Sunday, 2nd February.	Monday, 3rd February.	Tuesday, 4th February.	Wednesday, 5th February.	Thursday, 6th February.	Friday, 7th February.	Number of rainy days.	of rainfall week.				
NORTH BENGAL—continued.	Chumpra.	Mothari	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.19	75.33	
		Mothari	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.14	85.67	
		Banarua	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	70.24	
SOUTH BENGAL	Barna	Gopalgunge	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	NH	35.43	
		Chuprah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.12	46.74	
		Chuprah	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.14	47.41	
	Shahabad	Bahadur	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.03	4.08	
		Bahadur	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.12	38.16	
		Bahadur	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.23	30.41	
	Aye	Arungabad	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.10	43.09	
		Aye	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.12	35.42	
		Aye	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.24	30.85	
	Patna	Patna	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.11	35.40	
		Patna	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	34.21	
		Patna	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	36.00	
CENTRAL AND SOUTH BENGAL	Monghyr	Reconna	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.12	31.49	
		Monghyr	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.08	48.33	
		Monghyr	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.21	41.08	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.16	35.11	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	4.24	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	26.1	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.21	47.02	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.14	41.07	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.22	39.45	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	30.19	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	43.32	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.12	43.06	
CENTRAL AND SOUTH BENGAL	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.20	38.54	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	46.97	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.06	40.06	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.22	40.04	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.24	35.59	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.20	34.77	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.36	40.40	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.16	43.21	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	20.41	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	33.97	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.19	30.90	
CENTRAL AND SOUTH BENGAL	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.31	40.10	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	NH	36.74	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.01	43.70	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	31.76	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	47.94	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	39.85	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.01	45.24	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.04	55.61	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.21	34.16	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	33.30	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	41.40	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	25.77	
CENTRAL AND SOUTH BENGAL	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.37	45.74	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	46.54	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	38.70	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	33.84	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.39	43.33	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	0.46	33.19	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	4.71	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	44.33	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	31.42	
	North Bengal	North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	35.38	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	
		North Bengal	.....	.....	.....	.....	.....	.....	.....	NH	NH	NH	?	?	

Explanation.—Indicates that rain has fallen. If the return for any day has not been received, the corresponding space is left blank. If any of the returns are missing, the corresponding space in the total rainfall column is left blank.

Calcutta, the 11th February 1890.

**SUMMARY OF THE RAINFALL AND METEOROLOGICAL OBSERVATIONS
TAKEN IN BENGAL FOR THE WEEK ENDING FRIDAY, THE 7TH
FEBRUARY 1890.**

During the previous week two disturbances had passed through the province, giving fairly general rain to most of the stations in the plains, while along the line of hills to the north and north-west of the province snow had fallen. A cold wave of northerly winds had thus set in over the province, and the general conditions were those of the north-east monsoon or cold weather in a pronounced form. The effects of the disturbances above noted have continued during the week under review, and normal cold-weather conditions have obtained almost throughout this period. Skies have consequently been almost cloudless, temperature and humidity have been low, pressure has been high, and no rain has fallen. Just towards the close of the week, however, the cool northerly current was beginning to fall off in force, and light southerly winds and calms were reported at some of the coast stations, so that the tendency at the end of the week was for temperature and humidity to rise; but on the whole the conditions for the week were typical for the cold weather.

Pressure.—The pressure changes during the week have not been of any particular importance. There was a slight but distinct rise on the 1st February, which continued on the 2nd, but on the 3rd a slight fall set in, which became more rapid on the 4th, though it had ceased on the 5th, when pressure commenced to rise again, the rise continuing on the 6th while on the 7th pressure was falling again. These slight oscillations are, however, only characteristic of fine settled weather. For the whole week the mean pressure has been in excess of the normal by about 0.04 inch to 0.07 inch, the excess being fairly equally distributed, though on the whole it has been largest in North Behar.

Temperature.—Has on the whole been generally rising slowly during the week, but there have been the usual oscillations from day to day. Taking the general mean temperature of the whole province into consideration, there has been an increase of about 1° to 2° above the temperature of the previous week. When compared with the normal, however, the temperatures recorded during the past week have been distinctly low, and the defects vary in the different districts from about half a degree up to two and a-half degrees; the mean defect in temperature of the whole province for the week equalling 1.6 degrees.

The actual temperatures during the week, the range from day to night, and their variation from the normal values are best seen in the following table, where the average maximum, minimum and mean temperatures at nine typical stations in different districts of the province are given, together with the normal values. From these figures it will be seen that the night temperatures have generally been in much larger defect than those of the day, and that the mean minimum temperatures of the week have been decidedly low.

The lowest temperature recorded during the week was 41.9° at Motihari:—

Table showing the excess or defect of the actual mean temperature from the normal for the week ending 7th February 1890.

	Normal mean maximum temperature for the week ending 7th February.	Actual mean maximum temperature for the week ending 7th February 1890.	Variation of actual mean from the normal.	Normal mean minimum temperature for the week ending 7th February.	Actual mean minimum temperature for the week ending 7th February 1890.	Variation of actual mean from the normal.	Normal mean daily temperature for the week ending 7th February.	Actual mean daily temperature for the week ending 7th February 1890.	Variation of actual mean from the normal.
Calcutta	87.7	85.3	-2.4	81.6	80.3	-1.3	74.5	72.8	-1.7
Barisal	70.2	77.3	+7.1	50.0	53.0	+3.0	67.8	65.3	-2.5
Bombay	80.0	78.1	-1.9	74.0	70.7	-3.3	67.4	65.4	-2.0
Bahar	80.0	70.7	-9.3	54.0	50.4	-3.6	67.0	60.8	-6.2
Bihar	75.1	75.1	0.0	40.7	40.0	-0.7	60.0	60.0	0.0
Bombay	78.8	77.0	-1.8	53.1	51.5	-1.6	67.0	64.7	-2.3
Bombay	76.5	75.8	-0.7	48.4	45.0	-3.4	65.0	60.9	-4.1
Bombay	75.3	75.7	+0.4	61.0	49.8	-11.2	63.9	62.7	-1.2
Bombay	68.0	65.0	-3.0	51.3	44.8	-6.5	57.0	44.17	-12.83

Rainfall.—Has been entirely absent from the province throughout the week.

The following table gives the summary of the temperature and rainfall data of each of the seven meteorological divisions of the province for the week ending Friday, the 7th of February 1890:—

February 1890 :-

METEOROLOGICAL DIVISIONS.	TEMPERATURE										RAINFALL									
	Highest observed during week.	Lowest observed during week.	Averages for week.				Average mean of week above or below normal mean of week.	Of week.			Rainy days.			Since 1st of month.		Since 1st of May 1880.				
			Of highest of each day.	Of lowest of each day.	Of mean for each day.	Average.		Normal average.	Variation.	Average number in week.	Normal average number in week.	Variation.	Average.	Normal average.	Average.	Normal average.				
Orissa	87.9	48.4	81.1	58.5	69.9	-2.6	Nil	0.24	-0.24	0.0	0.4	-0.4	Nil	0.31	62.10	63.70				
South-West Bengal	84.3	44.9	70.0	51.8	65.4	-2.1	Nil	0.39	-0.30	0.0	0.6	-0.6	Nil	0.30	62.61	62.32				
East Bengal	81.1	47.0	77.4	50.6	64.0	-2.3	Nil	0.24	-0.28	0.0	0.4	-0.4	Nil	0.28	70.60	74.80				
North Bengal*	78.6	42.7	77.1	60.6	61.9	-0.7	Nil	0.12	-0.14	0.0	0.4	-0.4	Nil	0.12	73.64	70.68				
North Bihar	77.4	41.9	74.5	63.6	59.1	-2.9	Nil	0.11	-0.11	0.0	0.4	-0.4	Nil	0.11	67.49	66.80				
South Bihar	79.8	42.6	76.7	47.2	61.9	-0.9	Nil	0.17	-0.17	0.0	0.6	-0.6	Nil	0.17	44.16	44.08				
Central Nagpur	79.5	40.0	76.1	40.6	62.2	-0.4	Nil	0.23	-0.23	0.0	0.6	-0.6	Nil	0.23	65.08	49.80				

* Chupra, Coochbeeh and Jalpigoree not included.

METEOROLOGICAL OFFICE, BENGAL;
The 11th February 1890.

A PEDLER,
Meteorological Reporter to the Govt. of Bengal.

Results of the Meteorological Observations taken at the Alipore Observatory from
2nd to 8th February 1890.

Month.	Date.	Maximum in sun.	Number of hours of bright sunshine.	Mean pressure barometer at 5½ Fahr.	TEMPERATURE.				HYGROMETRY.				Prevailing direction.	Miles recorded.	Rain.	WEATHER.
					Mean.	Maximum.	Range.	Minimum.	Mean wet bulb.	Vapour tension.	Dew point.	Humidity.				
1890.		°		Inches.	°	°	°	°	°	Inches	°	%			Inches.	
Feb.	2nd	131.2	9.6	30.091	63.9	76.4	24.1	52.3	55.9	0.346	48.8	61	W by S and variable	54	Nil	Clear, Δ .
"	3rd	132.5	9.9	.055	64.2	77.3	23.7	53.6	56.5	.356	49.6	61	N and NNW	62	"	Clear, Δ .
"	4th	130.5	9.2	.012	64.9	78.5	25.2	53.3	57.6	.381	51.4	66	W and variable	39	"	Clear, Δ .
"	5th	132.1	9.6	.027	65.7	78.0	23.7	54.3	58.2	.392	52.3	64	SW by W and variable.	57	"	Clear, Δ .
"	6th	130.8	9.3	.046	64.7	77.6	24.7	52.9	57.3	.374	50.9	65	NNE, calm and variable.	38	"	Clear, Δ , =.
"	7th	134.3	9.8	.002	66.3	80.8	26.3	54.5	59.8	.432	54.9	70	SW, NNW, and calm	37	"	Clear, Δ , =.
"	8th	137.5	9.4	.037	67.6	80.8	22.6	58.2	61.2	.456	56.4	67	NNW and NNE	44	"	Clear, Δ , =.

The mean pressure of the seven days ... 30.039
 The average pressure of the corresponding period for 24 years, S.-G.'s Office ... 29.970

The total number of hours of bright sunshine ... 66.6
 The maximum possible number of hours of sunshine ... 78.2

The mean temperature of the seven days ... 65.3
 The average temperature of the corresponding period for 24 years, S.-G.'s Office ... 70.3
 The extreme variation of temperature ... 28.5
 The maximum temperature ... 80.8

The highest velocity of the wind in one hour ... 7

The highest pressure of wind on one square foot ... Not measurable.

The mean relative humidity ... 65
 The average relative humidity of the corresponding period for 24 years, S.-G.'s Office ... 69

The total fall of rain from 2nd to 8th February 1890 ... Nil
 The average fall of the corresponding period for 24 years, S.-G.'s Office ... 0.20
 The total fall from 1st January to 8th February 1890 ... 0.77
 The average fall of the corresponding period for 24 years, S.-G.'s Office ... 0.65

The mean pressure, temperature, &c., are deduced from the traces of the Barograph and Thermograph, and from observations made at 6h, 10h, 16h and 22h.

The maximum and minimum temperatures are obtained from self-registering thermometers. All the thermometers are verified, and the readings have been corrected to a standard constructed and verified at the Kew Observatory. They are exposed under a thatched shed open at the sides, and are suspended four feet above the ground.

The barometer readings are corrected approximately to those of the standard, Newman's No. 86, formerly at the Surveyor-General's Office.

The hygrometric elements are obtained from Tables III, IV, and V of the official tables computed in the Meteorological Office, and based on Regnault's modifications of August's formula.

The directions and the movement of the wind are taken from the trace of a Beekley's anemograph.

The mouth of the rain-gauge is one foot above the ground.

Δ dew, = fog.

O. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, GOVT. OF INDIA;
 Calcutta, the 10th February 1890.

Abstract of the Results of the Barometric and Thermometric Observations taken at 10 a.m. at the Meteorological Office, Chowringhee, in the month of January 1890.

	Inches.	Date.
The mean pressure at 10 a.m. during the month ...	30.092	
The mean temperature at 10 a.m. during the month ...	70.5	
The highest temperature during the month ...	82.9	19th and 24th.
The lowest temperature during the month ...	48.4	28th.
The absolute range of temperature during the month ...	34.5	
The mean daily range of temperature during the month ...	21.1	
The greatest range of temperature in one day during the month ...	26.0	28th
The mean 10 a.m. humidity during the month ...	67 $\frac{1}{2}$	
The mean 10 a.m. vapour tension during the month ...	50.6	
The total rainfall of the month ...	1.02	
The greatest fall in 24 hours ...	1.02	26th.
The number of rainy days in the month ...	1	

C. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, INDIA,

The 3rd February 1890.

Results of the Barometrical and Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 2nd to 8th February 1890.

MONTH.	Date.	Pressure at 10 A.M. corrected and reduced to 32° Fahr.	TEMPERATURE.						HYGROMETRY.			Rainfall past 24 hours.
			Daily mean.	Maximum.	Range.	Minimum.	Dry bulb at 10 A.M.	Wet bulb at 10 A.M.	Vapour tension at 10 A.M.	Dew point at 10 A.M.	Humidity at 10 A.M.	
		Inches.	°	°	°	°	°	°	Inches.	°	%	Inches.
Feb. 1890 ...	2nd	30.178	65.4	78.2	25.9	52.4	69.6	58.7	348	49.0	45	Nil
" " ...	3rd	30.148	65.2	77.9	25.5	52.4	70.1	58.7	344	48.6	46	"
" " ...	4th	30.104	67.0	79.0	25.9	54.0	72.6	59.7	343	48.6	42	"
" " ...	5th	30.110	67.4	79.9	25.0	54.9	71.4	57.7	296	44.6	40	"
" " ...	6th	30.126	65.8	79.7	25.8	53.9	71.6	57.7	293	44.4	38	"
" " ...	7th	30.093	69.0	82.1	29.1	55.9	71.6	56.2	272	62.5	74	"
" " ...	8th	30.102	70.4	81.9	28.0	55.9	72.6	57.1	291	63.7	74	"

The mean 10 a.m. pressure of the seven days ...	30.125
The mean temperature of the seven days ...	67.3
The extreme variation of temperature ...	29.7
The maximum temperature ...	82.1
The mean 10 a.m. relative humidity of the seven days ...	52 $\frac{1}{2}$
The total fall of rain from 2nd to 8th February 1890 ...	Nil
The daily mean temperatures are the crude means of maximum and minimum temperatures.	

C. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, INDIA ;

The 10th February 1890.

MEMORANDUM.

THE returns from the principal Municipalities in Bengal, for the week ending 25th January 1890, present the following results:—

1. The birth-rate in these Municipalities stood at 22·8 per 1,000 of population, against very nearly the same proportion, viz., 23·1 per 1,000, during the preceding week ending 18th January, and the death-rate 18·5, against 21·8 per 1,000, indicating a retrogression in the registration of the latter events.

2. The highest proportions of births and deaths were returned from the following Municipalities:—

Births.			Deaths.		
		Ratio per mille.			Ratio per mille.
Ranaghat	...	47·9	Poori	...	62·9
Mozufferpore	...	47·8	Jessore	...	49·0
Serampore	...	41·2	Comillah	...	42·4
Durbhanga	...	39·3	Hughli and Chinsurah	...	36·1
Darjiling	...	37·0	Chittagong	...	30·5
Santipore	...	36·8			
Monghyr	...	35·3			
Narainganj	...	33·1			
Hughli and Chinsurah	...	32·8			
Rampore Beaulash	...	31·6			

3. The following figures represent the rates of mortality from the principal diseases under record, during the week under notice, contrasted with similar information for the preceding week ending 18th January:—

			Ratio per mille during the weeks ending—	
			25th January 1890.	18th January 1890.
Cholera	...	...	1·8	2·3
Small-pox	...	...	·3	·6
Fever	...	...	7·8	8·9
Bowel-complaints	...	...	3·3	3·1
Injury	...	...	·5	·3
Other causes	...	...	4·7	6·6

indicating chiefly that there was a decrease of mortality from fever and the unspecified diseases coming under the head of "Other causes."

4. Of the diseases mentioned above, cholera, fever, bowel-complaints, and "Other causes" proved conspicuously fatal in the following Municipalities:—

Cholera.		Fever.		Bowel-complaints.		Other causes.	
	Ratio per mille.		Ratio per mille.		Ratio per mille.		Ratio per mille.
Comillah	23·1	Jessore	24·6	Poori	14·6	Comillah	19·3
Hughli and Chinsurah	9·8			Mozufferpore	13·2	Gya	10·2
Howrah	8·0						

The mortality from small-pox in the Poori Municipality, although still high, was considerably below that of the preceding week ending 18th January, viz., 10·5, against 18·9 per 1,000 of population.

5. Under the heads of Sex, Class and Age, the mortality of the week stood as follows:—

According to Sex.		According to Class		According to Age.	
	Ratio per mille.		Ratio per mille.		Ratio per mille.
Males	2·3	Christians	44·8	Under 1 year	189·3
Females	10·6	Hindus	17·9	1 and under 5 years	16·2
Ratio of male deaths to every 100 female deaths, calculated on the proportion such mortality bears to the total male and female population	125	Mahomedans	19·8	5 " 10 "	13·7
				10 " 15 "	10·3
				15 " 20 "	9·6
				20 " 30 "	11·8
				30 " 40 "	13·1
				40 " 50 "	10·4
				50 " 60 "	17·4
				60 years and upwards	59·3

W. H. GREGG, *Dip. Publ. Health, Camb.*,
Sanitary Commissioner for Bengal.

The 10th February 1890.

[illegible]

OFFICE OF SANITARY COMMISSIONER FOR BENGAL,
The 10th February 1890

W. H. GREGG, Dip. Publ. Health, Camb.,
Sanitary Commissioner for Bengal.

PUBLIC WORKS DEPARTMENT, BENGAL.

IRRIGATION BRANCH.

IRRIGATION OPERATIONS FOR THE OFFICIAL YEAR 1889-90.

Areas leased for Irrigation up to the end of November 1889.

CIRCLE.	DISTRICT.	CANAL.	Ret. mated full discharge.	Average discharge in month.	C. ft.	C. ft.	C. ft.	Discharge utilized.	Approx. area of land irrigated during the year up to the end of this month.	Approx. area of land irrigated under the same date last year.	DETAILS OF AREAS LEASED.					RAINFALL, 1889-90.		RAINFALL, 1888-89.		REMARKS.			
											Five years, Khari.	Five years, all crops.	ANNUAL LEASES.				During month.	Up to end of month.	During month.		Up to end of month.		
													Khari.	Bar.	Sugar cane.	Rhadol.						Hot weather.	Total.	Grand Total.
Ganges.	Outback.	Taldanda, 1st Reach.	1,542	416	229	...	...	10,683	9,931	...	...	...	...	...	...	...	11 90	72 09	11 59	09 46	No sugar filed.
		Taldanda, 2nd Reach.	966	288	87,764	27,031	67 45	6 40	4 51		4 51	
		Bachchra.	776	182	78	81,519	47,401	73 31	1 06	5 52		5 52	
		Kendrapara.	1,007	337 74	147 84	5,223	1,717	10 31	71 21	2 12		46 25	
		Gobri.	377 32	121	12 53	2,345	10 31	71 21	2 12		46 25	
		Gobri Bitterson.	649	64 79	147 84	2,345	10 31	71 21	2 12		46 25	
		Pattansomdi.	883	74 20	9 50	18,438	10 31	71 21	2 12		46 25	
		Rich Level.	609	139 15	60 52	2,345	10 31	71 21	2 12		46 25	
		Range I, Level.	737 16	32 71	79 65	2,345	10 31	71 21	2 12		46 25	
		Range II, Level.	737 16	32 71	79 65	2,345	10 31	71 21	2 12		46 25	
Ganges.	Barabare.	Range III, Level.	737 16	32 71	79 65	...	...	...	2,345	...	...	...	...	...	...	...	...	10 31	71 21	2 12	46 25
		Total.	154,110	120,751	...	...	...	...	137,640	120,751	...	...	...	...	...	...	...	...	...	...	...
		Total of the corresponding period of last year.	...	...	...	...	...	...	121,621	121,621	...	...	...	...	...	...	...	...	...	...	...
		Minsapore.	1,411	372	147	...	...	...	60,683	40,610	...	...	...	...	...	...	...	...	...	...	...
		Panchkora.	822	...	...	...	...	...	318	...	...	...	...	...	...	...	...	...	...	...	...
		Tidal Range I and II.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		Total.	...	...	...	...	...	...	61,777	61,777	...	...	...	...	...	...	...	...	...	...	...
		Total of the corresponding period of last year.	...	...	...	...	...	...	53,000	53,000	...	...	...	...	...	...	...	...	...	...	...
		Ganges.	Barabare.	Western Main.	4,342	1,500	60	18,312	18,312
				Barabare.	1,238	400	235	76,401	77,125
Barabare.	2,000			908	670	...	...	...	147,443	147,443	...	...	...	...	...	...	...	...	...	...	...
Barabare.	1,400			373	246	...	...	...	147,443	147,443	...	...	...	...	...	...	...	...	...	...	...
Total.	...			...	...	...	...	...	304,886	304,886	...	...	...	...	...	...	...	...	...	...	...
Total of the corresponding period of last year.	...			...	...	...	...	...	191,637	191,637	...	...	...	...	...	...	...	...	...	...	...
Grand Total.	...			...	...	...	...	...	191,637	191,637	...	...	...	...	...	...	...	...	...	...	...
Grand Total of the corresponding period of last year.	...			...	...	...	...	...	183,430	183,430	...	...	...	...	...	...	...	...	...	...	...
Ganges.	Barabare.			Grand Total.	191,637	191,637
				Grand Total of the corresponding period of last year.	183,430	183,430
		Grand Total.	...	...	...	...	...	...	191,637	191,637	...	...	...	...	...	...	...	...	...	...	...
		Grand Total of the corresponding period of last year.	...	...	...	...	...	...	183,430	183,430	...	...	...	...	...	...	...	...	...	...	...
		Grand Total.	...	...	...	...	...	...	191,637	191,637	...	...	...	...	...	...	...	...	...	...	...
		Grand Total of the corresponding period of last year.	...	...	...	...	...	...	183,430	183,430	...	...	...	...	...	...	...	...	...	...	...
		Grand Total.	...	...	...	...	...	...	191,637	191,637	...	...	...	...	...	...	...	...	...	...	...
		Grand Total of the corresponding period of last year.	...	...	...	...	...	...	183,430	183,430	...	...	...	...	...	...	...	...	...	...	...
		Grand Total.	...	...	...	...	...	...	191,637	191,637	...	...	...	...	...	...	...	...	...	...	...
		Grand Total of the corresponding period of last year.	...	...	...	...	...	...	183,430	183,430	...	...	...	...	...	...	...	...	...	...	...

G. A. G. SHAW,.

CALCUTTA:

CIRCULAR AND EASTERN CANALS.

*Approximate Return of Traffic for the week ending Saturday, the 8th February 1890,
as compared with the corresponding week of the previous year.*

NATURE OF CARGO.	WEEK ENDING SATURDAY, THE 8TH FEBRUARY 1890.			WEEK ENDING SATURDAY, THE 9TH FEBRUARY 1889.		
	Number of boats.	Weight of cargo.	Tollage.	Number of boats.	Weight of cargo.	Tollage.
	No.	Mds.	Rs.	No.	Mds.	Rs.
Rice and paddy ...	1,807	8,45,093	5,900	1,576	4,07,000	7,006
Jute ...	179	1,35,400	2,830	110	82,150	1,480
Firewood ...	112	69,925	1,080	97	44,300	674
Other articles ...	979	2,40,465	3,510	1,113	2,24,480	3,297
Total ...	3,077	7,90,885	12,810	2,896	7,57,860	12,457

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY.

Approximate Return of Traffic for week ended 1st February 1890, on 1,526½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchan- dise.	Total.
		Rs. A. P.	Mds. S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ...	947,965	2,25,017 11 0	24,72,485 30	5,73,894 12 6	20,375 4 6	9,79,587 11 6	65,622½	89,657½	152,280½
Or per mile of railway ...	...	186 13 4	...	376 3 2	13 5 8	376 0 3	...	...	...
For previous 4 weeks of half-year ...	952,143	10,81,322 9 0	91,60,669 30	20,90,696 1 0	71,085 10 0	22,42,507 5 0	236,035½	326,883½	562,919½
Total for 5 weeks ...	1,899,108	13,06,340 4 0	1,16,33,095 30	26,63,902 14 6	91,461 14 0	31,21,795 0 6	391,658	415,540	715,234
COMPARISON.									
Total for corresponding week of previous year ...	879,795	2,34,976 0 4	27,65,780 10	6,23,252 3 9	14,969 8 4	9,78,517 12 4	66,330	89,318	167,648
Per mile of railway correspond- ing week of previous year ...	...	219 9 4	...	411 13 4	9 13 3	641 3 11	...	...	...
Total in corresponding date of previous year ...	1,180,104	13,77,073 14 1	1,23,41,869 30	29,82,680 7 9	71,069 0 2	34,60,511 15 1	311,632	471,464	783,496

* The decrease in coaching traffic is due to figures for the corresponding period of 1889 having included earnings on account of troop extra trains, and of "Magh Mela."

*Approximate Statement of gross receipts of the East Indian Railway, prepared in accordance with Public Works
Department Circular No. XXI, Railway, dated 23rd July 1883.*

RECEIPTS FOR WEEK ENDING 12th FEBRUARY 1890.			RECEIPTS FOR WEEK ENDING 1st FEBRUARY 1889.			TOTAL RECEIPTS FROM 1st APRIL 1886 TO 2ND FEBRUARY 1889.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 1st FEBRUARY 1890.			Total increase in 1889.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
1,486½	Rs. 9,79,587	Rs. 641	1,526½	Rs. 9,79,586	Rs. 676	1,538½	Rs. 3,09,40,557	Rs. 200	1,526½	Rs. 3,04,82,802	Rs. 200	Rs. 547	Rs. 2,57,676

PATNA-GYA STATE RAILWAY.

Approximate Return of Traffic for week ended 1st February 1890, on 57½ miles open.

	COACHING TRAFFIC		MERCHANDISE AND MINERAL TRAFFIC		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week or per mile of railway	11,898	6,113 0 0	39,961 10	2,909 13 0	22 9 0	8,075 8 0	1,897	587	2,484
For previous 4 weeks of half-year	47,982	24,471 6 0	1,51,200 10	8,423 12 0	179 15 0	33,073 1 0	8,234	2,853	11,087
Total for 5 weeks	59,880	30,584 6 0	1,91,162 20	11,333 11 0	202 8 0	41,148 9 0	10,131	3,440	13,571
COMPARISON.									
Total for corresponding week of previous year	11,702	6,331 7 7	22,928 30	1,634 8 0	29 5 9	8,015 8 6	1,078	416	1,494
Per mile of railway corresponding week of previous year	296	110 11 0	401 20	28 14 10	0 5 8	141 2 1	...	...	...
Total to corresponding date of previous year	57,884	30,043 4 0	1,50,197 10	8,541 12 0	161 1 0	39,220 1 0	9,087	2,857	11,944

Approximate Statement of gross receipts of the Patna-Gya State Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 2ND FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 2ND FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 1ST FEBRUARY 1890.			Total increase in 1890.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
57½	Rs. 6,913	140	57½	Rs. 6,076	122	57½	Rs. 12,989	162	57½	Rs. 12,989	162	16,153	...

TARKESSUR BRANCH RAILWAY.

Approximate Return of Traffic for week ended 1st February 1890, on 22½ miles open.

	COACHING TRAFFIC		MERCHANDISE AND MINERAL TRAFFIC		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week or per mile of railway	10,219	6,975 9 0	12,389 20	474 0 0	8 0 0	8,457 9 0	998	79	1,077
For previous 4 weeks of half-year	40,927	17,623 8 0	64,104 0	1,882 8 0	25 15 0	19,530 13 0	2,221	240	2,461
Total for 5 weeks	51,146	24,600 1 0	76,493 20	2,356 8 0	33 15 0	28,067 12 0	3,219	319	3,538
COMPARISON.									
Total for corresponding week of previous year	10,799	6,968 9 0	14,508 16	231 8 0	7 8 0	8,207 8 8	968	63	1,031
Per mile of railway corresponding week of previous year	224	224 14 2	...	12 12 8	0 3 5	263 9 8	...	...	...
Total to corresponding date of previous year	42,768	22,564 1 7	61,591 20	1,560 8 0	31 3 9	24,375 11 8	2,234	230	2,464

Approximate Statement of gross receipts of the Tarkessur Branch Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 2ND FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 2ND FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 1ST FEBRUARY 1890.			Total increase in 1890.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
22½	Rs. 6,968	243	22½	Rs. 6,064	241	22½	Rs. 13,032	236	22½	Rs. 13,032	236	16,153	...

EASTERN BENGAL STATE RAILWAY.

(INCLUDING N. B., DACCA, K. AND D., AND ASSAM-BEHAR SECTIONS.)

Approximate Return of Traffic for week ended 25th January 1890, on 747 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated), including steam-bus.	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. s	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week...	180,694	79,150 0 0	6,62,240 0	1,40,170 0 0	15,550 0 0	2,34,860 0 0	22,516	20,400	42,916
per mile of railway...	187	106 0 0	878 0	188 0 0	20 0 0	250 0 0			
of previous 3 weeks of half-year	416,420	1,95,110 0 0	16,60,060 0	3,97,440 0 0	41,840 0 0	6,34,280 0 0	59,527	55,718	115,245
Total for 4 weeks	586,810	2,74,260 0 0	23,12,320 0	5,37,600 0 0	57,390 0 0	8,69,050 0 0	82,143	76,118	158,261
COMPARISON.									
Total for corresponding week of previous year	129,278	51,735 0 0	5,28,100 0	1,16,437 0 0	12,833 0 0	2,11,005 0 0	21,984	20,521	42,505
per mile of railway corresponding period of previous year	191	121 0 0	705 0	173 0 0	17 0 0	285 0 0			
Total to corresponding date of previous year	525,105	2,50,000 0 0	18,96,070 0	4,35,300 0 0	52,807 0 0	7,47,200 0 0	80,033	111,107	191,140

* Excluding steamer earnings.

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Eastern Bengal State Railway.

RECEIPTS FOR WEEK ENDING 25th JANUARY 1889.			RECEIPTS FOR WEEK ENDING 25th JANUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 25th JANUARY 1889.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 25th JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
747	Rs. 2,11,005	Rs. 513	747	Rs. 2,34,000	Rs. 514	673	Rs. 89,89,595	Rs. 311	725	Rs. 99,05,285	Rs. 305	Rs. 6,65,000	Rs. ...

* Audited up to week ending 14th December 1889.

BENGAL CENTRAL RAILWAY.

Approximate Return of Traffic for week ended 25th January 1890, on 125 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ...	22,540	10,500 0 0	40,540 0	2,530 0 0	60 0 0	13,090 0 0	3,736	1,636	5,372
per mile of railway ...	207	84 0 0	324 0	20 0 0	1 0 0	105 0 0	...	...	...
previous 3 weeks of half-year ...	74,650	20,530 0 0	1,07,500 0	5,940 0 0	210 0 0	23,730 0 0	9,606	4,900	14,506
Total for 4 weeks ...	96,490	31,030 0 0	1,48,040 0	8,470 0 0	270 0 0	46,820 0 0	13,342	6,536	19,878
COMPARISON.									
Total for corresponding week of previous year ...	20,048	8,082 0 0	41,708 0	2,185 0 0	1,000 0 0	12,900 0 0	3,735	1,657	5,392
per mile of railway corresponding period of previous year ...	208	77 0 0	334 0	18 0 0	9 0 0	104 0 0	...	...	...
Total to corresponding date of previous year ...	68,080	24,882 0 0	1,04,411 0	5,214 0 0	3,509 0 0	46,705 0 0	13,806	7,187	21,003

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Bengal Central Railway.

RECEIPTS FOR WEEK ENDING 25th JANUARY 1889.			RECEIPTS FOR WEEK ENDING 25th JANUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 25th JANUARY 1889.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 25th JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked.	Rs.	Rs.
125	Rs. 12,900	Rs. 104	125	Rs. 13,000	Rs. 105	125	Rs. 5,52,860	Rs. 110	125	Rs. 5,17,025	Rs. 116	Rs. 24,105	Rs. ...

* Audited up to week ending 14th December 1889.

DACCA STATE RAILWAY.

Approximate Return of Traffic for week ended 25th January 1890, on 86 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ...	15,730	4,680 0 0	34,780 0	3,430 0 0	85 0 0	8,470 0 0	2,414	1,130	3,544
Or per mile of railway	183	50 0 0	400 0	40 0 0	1 0 0	110 0 0	.....	.....	.....
For previous 3 weeks of half-year ...	45,530	12,930 0 0	90,830 0	10,040 0 0	230 0 0	27,560 0 0	6,640	2,990	9,630
Total for 4 weeks ...	61,300	17,610 0 0	1,21,100 0	13,470 0 0	700 0 0	37,030 0 0	9,054	4,120	13,174
COMPARISON.									
Total for corresponding period of previous year ...	15,130	4,435 0 0	10,580 0	1,250 0 0	84 0 0	6,160 0 0	2,468	883	3,351
Per mile of railway corresponding period of previous year ...	177	50 0 0	120 0	15 0 0	1 0 0	71 0 0	.....	.....	.....
Total to corresponding date of previous year ...	54,980	17,314 0 0	44,970 0	74,921 0 0	433 0 0	22,860 0 0	9,345	2,917	12,262

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Dacca State Railway.

RECEIPTS FOR WEEK ENDING 25th JANUARY 1890.			RECEIPTS FOR WEEK ENDING 15th JANUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 25th JANUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 25th JANUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
86	4,180	73	86	9,470	110	86	1,46,043	67	86	* 3,21,973	37	78,300	.....

* Audited up to week ending 14th December 1889.

NALHATI STATE RAILWAY.

Approximate Return of Traffic for the week ending 1st February 1890, on 27½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ...	3,023	1,067 0 0	10,556 0	723 0 0	14 0 0	1,831 0 0	500	354	854
Or per mile of railway	111	60 0 0	387 0	26 0 0	1 0 0	67 0 0	.....	.....	.....
For previous 3 weeks of half-year ...	10,751	2,702 0 0	54,053 0	3,914 0 0	51 0 0	7,117 0 0	1,610	807	2,417
Total for 4 weeks ...	13,904	4,519 0 0	65,457 0	4,036 0 0	65 0 0	8,948 0 0	2,027	1,161	3,188
COMPARISON.									
Total for corresponding week of previous year ...	3,223	1,170 0 0	10,000 0	945 0 0	14 0 0	2,139 0 0	500	435	935
Per mile of railway corresponding week of previous year ...	119	66 0 0	360 0	34 0 0	1 0 0	79 0 0	.....	.....	.....
Total to corresponding date of previous year ...	14,244	5,483 0 0	74,700 0	3,885 0 0	65 0 0	9,440 0 0	2,300	1,235	3,535

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Nalhati State Railway.

RECEIPTS FOR WEEK ENDING 2nd FEBRUARY 1890.			RECEIPTS FOR WEEK ENDING 1st FEBRUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 2nd FEBRUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 1st FEBRUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
27½	2,120	79	27½	1,963	67	27½	64,620	74	27½	64,607	74	.....	.....

TIRHOOT STATE RAILWAY.

Approximate Return of Traffic for the week ending 1st February 1890, on 273 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. C.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	48,941	19,438 0 0	2,09,381 0	33,001 0 0	4,378 0 0	37,704 0 0	9,485	9,318	18,783
Or per mile of railway	181	71 0 0	1,044 0	120 0 0	3 0 0	134 0 0			
For previous 3 weeks of half-year	162,270	71,902 0 0	3,40,280 0	94,122 0 0	14,000 0 0	1,04,064 0 0	31,516	29,932	61,448
Total for 4 weeks	209,211	91,397 0 0	11,50,660 0	1,26,818 0 0	23,578 0 0	2,61,788 0 0	37,051	39,250	67,301
COMPARISON.									
Total for corresponding week of previous year	35,857	16,098 0 0	1,19,806 0	11,065 0 0	2,918 0 0	20,016 0 0	4,004	4,108	11,112
Per mile of railway corresponding week of previous year	131	59 0 0	419 0	42 0 0	1 0 0	73 0 0			
Total to corresponding date of previous year	177,684	61,941 0 0	6,89,844 0	87,728 0 0	14,401 0 0	1,37,126 0 0	24,918	25,708	51,626

* Steam-boat earnings excluded in calculating "Total earnings per mile of Railway."

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Tirhoot State Railway.

RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1890.			RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1889.			TOTAL RECEIPTS FROM 1ST APRIL 1888 TO 1ST FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 1ST FEBRUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Rs.	Rs.
Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.			
273	20,616	105	273	37,704	111	364-68	13,96,627	125	273	17,25,108	160	3,39,481	.....

DARJEELING-HIMALAYAN RAILWAY COMPANY, LIMITED.

	Rs.
Approximate earnings for week ending 18th January 1890	8,031
Corresponding week last year	8,321
Decrease	290
Receipts from 1st to 18th January 1890	17,513
From 1st to 19th January 1889	16,338
Increase	1,175
Miles open week ending 18th January 1890	51
Corresponding week last year	51
Receipts per mile open week ending 18th January 1890	Rs. A. P. 157 7 6
Corresponding week last year	163 2 7
Decrease	5 11 1



SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, FEBRUARY 19, 1890.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on payment of Six Rupees per annum if delivered in Calcutta, or Twelve Rupees if sent by Post.

CONTENTS.

Page	Page
ARRANGEMENTS to be adopted for the working of goods traffic into and out of Calcutta after the completion of the Kidderpore Docks ...	399
Report on the state of the Salt Market for the third quarter of 1889-90 ...	400
Rainfall, Weather, and State and Prospects of the Crops ...	403
Statement showing the Quantities of the Principal Staples of Traffic imported and exported into Calcutta from the interior during the month of November 1889 ...	406
Tables showing the Monthly and Annual Rainfall at 358 Rainfall-recording Stations in Bengal for 1889 ...	409
Results of the Meteorological Observations taken at the Alipore Observatory from 9th to 15th February 1890 ...	415
Meteorological Report of the Province of Bengal for the week ending Friday the 14th of February 1890 ...	416
Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 14th of February 1890 ...	419
Results of the Barometrical and Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 9th to 15th February 1890 ...	420
Statement showing the Results of the Registration of Births and Deaths in the Principal Municipalities in Bengal during the week ending 1st February 1890 ...	423
Orissa Circle—Taldandah Canal System for the month of November 1889 ...	426
South Western Circle—Nudda Rivers during the month of December 1889 ...	429
South Western Circle—Orissa Coast Canal System during the month of December 1889 ...	430
South Western Circle—Calcutta and Eastern Canals during the month of December 1889 ...	440
Circular and Eastern Canals for the week ending 15th February 1890 ...	443
East Indian Railway for the month of December 1889 ...	444
Weekly Return of Traffic Receipts on Indian Railways ...	445

ARRANGEMENTS TO BE ADAPTED FOR THE WORKING OF GOODS TRAFFIC INTO AND OUT OF CALCUTTA AFTER THE COMPLETION OF THE KIDDERPORE DOCKS.

No. 461 Marine.

GOVERNMENT OF BENGAL—PUBLIC WORKS DEPARTMENT.

Dated Calcutta, the 18th February 1890.

RESOLUTION.

READ—

A letter No. 0190R.T., dated the 4th February 1890, from the Government of India, suggesting that a Committee should be appointed to discuss the various questions which will arise in connection with the working of traffic into and out of Calcutta after the completion of the Kidderpore Docks.

RESOLUTION.—On the completion of the Kidderpore Docks the existing arrangements for working both the export and the import goods traffic will have to be largely modified, and, with the concurrence of the Government of India, His Honour the Lieutenant-Governor is pleased to appoint the gentlemen named below to form a Committee to consider and advise on the arrangements that should be adopted on the opening of the Docks:—

The Hon'ble Mr. F. M. Halliday	...	President.
Colonel L. Conway-Gordon, R.E., C.I.E.	...	Representing the Government of India.
Mr. W. B. Beatie	...	Representing the Government of Bengal.
The Hon'ble Sir Alexander Wilson	...	Representing the Commissioners for making
Mr. G. H. Simmons	...	Improvements in the Port of Calcutta.
Mr. J. L. Mackay	...	Representing the Bengal Chamber of Com-
Mr. W. W. Petrie	...	merce.
Mr. D. W. Campbell, C.I.E.	...	Representing the East Indian Railway Com-
		pany.
Lieutenant-Colonel G. F. O. Boughoy, R.E.	...	Representing the Eastern Bengal State Rail-
		way.

The Committee will consider all questions that require settlement in connection with—

- (a) the shipment and discharge of the cargoes of the vessels frequenting the port of Calcutta;
- (b) the transport of goods, whether rail-borne, water-borne, or partly rail-borne and partly water-borne, to and from vessels lying at any place in the port of Calcutta.

The dates for the meetings of the Committee will be fixed by the President, and the Committee's Report will be forwarded by him to the Secretary to the Government of Bengal, in the Public Works Department.

ORDER.—Ordered that a copy of this Resolution be forwarded to the Hon'ble Mr. Halliday and to each Member of the Committee.

Ordered also that a copy of this Resolution be forwarded to the Government of India with reference to the letter from that Government cited above.

By order of the Lieutenant-Governor of Bengal,

E. J. MARTIN,
Joint-Secy. to the Govt. of Bengal.

REPORT ON THE STATE OF THE SALT MARKET FOR THE THIRD QUARTER OF 1889-90.

No 89B, dated Calcutta, the 6th February 1890.

From—K. G. GUPTA, Esq., Offg. Secretary to the Board of Revenue, L.P.,
To—The Secretary to the Government of Bengal, Financial Department.

I AM directed by the Board of Revenue to submit the following report on
SALT. the state of the salt market for the third quarter of
1889-90, comprising the months of October, November, and December 1889.

THE HON'BLE F. B. PRACOCK.

2. The quantity of salt of every description cleared during the quarter under report amounted to 24,37,503 maunds 14 seers 3 chittacks, against 23,98,512 maunds 30 seers 14 chittacks in the previous quarter, and 24,20,274 maunds 38 seers 9 chittacks in the corresponding quarter of the previous year; and the net amount of duty levied thereon was Rs. 57,16,963-2, against Rs. 55,10,452-14 in the previous quarter, and Rs. 56,74,386 in the corresponding quarter of the previous year.

3. The quantity of excise salt sold in Orissa during the quarter under review and the quantity which remained in store at the close of the quarter are shown in table I.—

TABLE I.

			Cuttack.	Pooree.	Balasore.
			Mds. s. t.	Mds. s. t.	Mds. s. t.
Balance at close of the last quarter	...	...	232 0 0	1,86,373 0 0	1,240 0 0
Manufactured or added during the quarter	...	...	.....	.....	.....
Total	...	...	232 0 0	1,86,373 0 0	1,240 0 0
Sales during the quarter	...	...	.....	16,609 0 0	120 0 0
Wastage	...	...	232 0 0	.....	.....
Total	...	...	232 0 0	16,609 0 0	120 0 0
Balance at close of the quarter	...	...	.....	1,70,864 0 0	1,120 0 0

4. The total sale of excise salt during the quarter under review amounted to 15,629 maunds, against 12,101 maunds in the previous quarter, and 84,327 maunds 88 seers 60 tolaks in the corresponding quarter of the previous year.

5. The subjoined table shows in comparison the importations into the port of Calcutta and the total clearances of sea-imported salt during the quarter under review and the corresponding quarters of the previous two years:—

TABLE II.

	1887-88.		1888-89.		1889-90.	
	Third quarter.		Third quarter.		Third quarter.	
	Imported.	Cleared.	Imported.	Cleared.	Imported.	Cleared.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Liverpool pungah	15,97,646	16,16,109	19,92,467	17,23,613	10,26,994	16,54,656
Foreign kurkutch	6,66,945	8,62,376	5,65,600	4,37,471	10,05,248	8,63,483
Indian ditto	1,54,951	1,57,000	1,50,630	1,31,990	6,640	1,30,002
Total	24,09,541	25,35,485	27,08,737	22,93,074	21,38,482	26,47,719

6. The following are the details of the Indian kurkutch salt shown in the above table:—

TABLE III.

	1887-88.		1888-89.		1889-90.	
	Third quarter.		Third quarter.		Third quarter.	
	Imported.	Cleared.	Imported.	Cleared.	Imported.	Cleared.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Bombay	1,54,951	1,57,000	1,50,630	1,31,990	.....	1,34,363
Cochin	.....	.....	.....	.....	.....	.....
Madras	.....	.....	.....	.....	.....	.....
Quddalore	.....	.....	.....	.....	.....	.....
Total	1,54,951	1,57,000	1,50,630	1,31,990	6,640	1,30,002

7. Table IV shows the quantity of sea-imported salt remaining in the warehouses at the close of the quarter as compared with the results of the previous four quarters:—

TABLE IV.

WHERE STORED.	Third quarter of 1887-88.	Fourth quarter of 1887-88.	First quarter of 1888-89.	Second quarter of 1888-89.	Third quarter of 1888-89.
	Mds.	Mds.	Mds.	Mds.	Mds.
Saltica Government golahs	15,19,709	16,64,397	21,40,053	23,55,265	17,41,84
Chittagong ditto do.	1,31,040	2,32,656	1,53,507	1,42,880	67,587
Total	16,51,349	18,97,053	22,93,560	24,98,145	18,09,437

8. The despatches of salt from Calcutta by water and the three railways passing the several salt-pass stations into the interior of the country, both east and west of the river Hooghly, during the quarter under review and the corresponding quarters of the previous two years, are shown in the table below:—

TABLE V.

PERIOD.	By the Balakrishna Bankrail.	By the Gowanahally.	By the Kidderpore.	By the Ballinghatta.	By the Ruttollah Ghat.	By the East Indian Railway.	By the Eastern Bengal and South-Eastern Railways or the Chitpore.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
Third quarter of 1887-88	2,78,480	1,51,080	1,03,294	76,700	5,30,644	19,095	1,94,010
Ditto of 1888-89	2,42,007	1,80,790	85,021	81,163	5,00,165	3,204	2,00,400
Ditto of 1889-90	2,00,534	1,18,313	76,155	69,690	5,03,003	2,110	2,13,578

9. The quantity of salt despatched by the East Indian Railway to stations beyond Buxar during the quarter under review amounted to 2,126 maunds 10 seers, as noted in the margin, against 1,518 maunds 30 seers in the previous quarter, and 8,808 maunds 20 seers in the corresponding quarter of the previous year.

10. The shipments of Liverpool salt for the port of Calcutta according to published market reports were as follow :—

						Tons
October	...	...	...	...	...	12,890
November	...	...	...	...	...	22,770
December	...	...	...	...	...	22,570
Total	...	...	...	...	...	58,230

No shipments were reported during the quarter under review for the port of Chittagong.

11. Table VI shows the market price per 100 maunds of Liverpool and other descriptions of salt at the close of each fortnight during the quarter as compared with those obtaining during the same period last year :—

TABLE VI.

DESCRIPTION OF SALT.	Prices on the 15th October		Prices on the 31st October		Prices on the 15th November		Prices on the 30th November		Prices on the 15th December		Prices on the 31st December	
	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.	1888.	1889.
	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
Liverpool punnah	80	116	84	105	91	103	95	100	85	105	80	104
French karkutah	62	...	60	...	60	...	60	...	60	...	60	...
Jedda ditto	60	55	59	56	60	57	60	55	60	54	60	53
Bombay ditto	77	52	90	52	88	50	88	51	90	55	90	54
Italian ditto	62	...	60	...	60	...	60	...	60	...	60	...
Morac ditto	55	50	55	50	55	50	57	50	55	54	54	53
Rock	55	...	55	...	55	115	55	...	75	150	75	150

12. The following table shows the quantity of sea-imported salt admitted into bond, and cleared from bond and shipboard, at Chittagong and Narain-gunge during the quarter under review and the corresponding quarter of 1888-89 :—

TABLE VII.

PORT.	DESCRIPTION OF SALT.	ADMITTED INTO BOND.		Cleared.	
		Third quarter of 1888-89.	Third quarter of 1889-90.	Third quarter of 1888-89.	Third quarter of 1889-90.
		Mds. s. c.	Mds. s. c.	Mds. s. c.	Mds. s. c.
Chittagong	Liverpool	1,20,000 0 0	...	65,987 14 0	63,814 0 0
	Madras	...	...	1 3 0	0 5 0
	Muscat	...	...	0 10 0	...
	Amman	...	...	...	0 30 0
Naraingunge	Liverpool	...	...	7,925 0 0	12,340 0 0
	Total	1,20,000 0 0	...	73,912 14 0	76,179 30 0

No transactions in sea-imported salt have been reported for the quarter from the ports of Cuttack, Pooree, and Balasore.

Rainfall, Weather, and State and Prospects of the Crops.

Statement showing Rainfall, Weather, and State and Prospects of the Crops in the different districts of Bengal, as reported to Government, during the week ending the 15th February, 1890.

No.	District and date of return.	Rainfall at Sudder Station in inches.	Character of the weather and state and prospects of the crops.
BENGAL.			
<i>Western Districts.</i>			
BUREWAN DIV.	1 Burdwan Feb. 15, '90	Nil	Weather—growing warm. In Ranigunge <i>rabbi</i> expected to give an 18-anna crop, and elsewhere it will be from 16 to 14 annas. There is more <i>rabbi</i> in Ranigunge than elsewhere, so the district crop may be 15 or 16 annas. Prices of common rice:— <div style="float: right; text-align: right;"> Sra. Burdwan ... 18 Culna ... 16 Cutwa ... 16½ Ranigunge ... 19 } per rupee </div>
	2 Bankura .. 15, '90	Nil	Weather—seasonable. <i>Rabbi</i> crops doing well. Pressing of sugarcane continues. Common rice 20½ seers per rupee at Bishenpore and 20 seers at Sudder.
	3 Birbhum .. 15, '90	Nil	Weather—growing warm. Prospects of crops continue excellent. Sugarcane very flourishing. Prices of rice all along the southern part of the district range from 18 to 20 seers per rupee, and in the central and northern portions 16 to 17 seers per rupee.
	4 Midnapur .. 15, '90	Nil	Weather—seasonable. General prospects good. <i>Rabbi</i> and indigo doing well in the Sudder subdivision. Prices of rice:— <div style="float: right; text-align: right;"> Sra. Sudder ... 18 Contai ... 24 Tamluk ... 19 Ghatal ... 20 } per rupee. </div>
	5 Hooghly .. 15, '90	Nil	Weather—seasonable. Outturn of <i>rabbi</i> very hopeful. Outturn of sugarcane good, especially in Jehanabad. Prices of common rice:— <div style="float: right; text-align: right;"> Sra. Sudder ... 12½ Serampore ... 14 Jehanabad ... 17½ } per rupee. </div>
PRESIDENCY DIV.	Howrah .. 15, '90	Nil	Weather—getting warmer. Prospects of <i>rabbi</i> crops continue good. Prices of common rice:— <div style="float: right; text-align: right;"> Sra. Howrah ... 12½ Uluberia ... 16 } per rupee. </div>
	<i>Central Districts.</i>		
	6 24 Pargha. Feb. 15, '90	Nil	Weather—seasonable. Good <i>amra</i> crop has been harvested. Prospects of winter crops also good. <i>Boro</i> rice is being cultivated in some parts. Price of common rice 16 seers per rupee.
	7 Nudda .. 15, '90	Nil	Weather—seasonable. Prospects of crops on the ground favourable. Cultivation of lands for <i>amra</i> going on.
	8 Khoolna .. 15, '90	Nil	Weather—seasonable. Reaping of <i>amra</i> completed; outturn good. State of <i>boro</i> crop good and of <i>rabbi</i> fair.
	9 Jessore .. 15, '90	Nil	Weather—getting warm. Harvesting of <i>amra</i> paddy over; outturn 14 annas in Magura and 16 annas in Narail. Linseed and other spring crops prospering. Prices of common rice 14 to 16 seers per rupee.
	10 Moorchahabad .. 15, '90	Nil	Weather—clear and cold. Prospect of <i>rabbi</i> continues favourable.
	11 Dinagepur .. 15, '90	Nil	Weather—days getting warmer, though nights still cool. Prospects of <i>rabbi</i> crops good. <i>Amra</i> harvesting nearly over. Sugarcane being pressed. Land being prepared for <i>khadoi</i> .
	12 Rajshahye .. 15, '90	Nil	Weather—seasonable. Prospects of <i>rabbi</i> crops good generally. Ganja manufacture commenced in Nowgong. Rice sells at 17 seers 3 chittacks per rupee.
	13 Rangpur .. 15, '90	Nil	Weather—getting warm. Prospects of tobacco and wheat continue good. Mustard is being gathered. Ploughing for <i>amra</i> and jute going on vigorously.
RAJSHAHY DIV.	14 Bogra .. 15, '90	Nil	Weather—nights chilly, but days getting warmer. Reaping of <i>amra</i> finished. Mustard, <i>kassari</i> , gram, &c., being reaped. Common rice selling at 22 seers per rupee.
	15 Pabna .. 15, '90	Nil	Weather—seasonable. <i>Amra</i> outturn about 14 annas in Serajunge and 12 annas in Sudder. Mustard and tobacco expected to be 12 annas crops. Sugarcane deficient. Prices of food-grains slightly lower.
	16 Darjeeling .. 15, '90	0-01	Weather—getting daily warmer. Wheat and barley progressing favourably. In Terai land is being prepared for <i>khadoi</i> crops. Prices of common rice:— <div style="float: right; text-align: right;"> Sra. Darjeeling ... 12 Kurseong ... 13 Siliguri ... 19 } per rupee. </div>
	17 Nijigoree .. 15, '90	Nil	Weather—seasonable. <i>Haimanti</i> paddy all cut. Condition of tobacco promising except in Salbari thanna. No change in prices.

No.	District and date of return.	Rainfall at Sudder Station in inches.	Character of the weather and state and prospects of the crops.
BENGAL.—concluded.			
Eastern Districts.			
Dacca Divn.	18 Dacca Feb. 15, '90	Nil	Weather—seasonable. Winter crops doing well. Sugarcane being pressed. Mustard and pulses being gathered. Fodder is available. No special change in the prices of food-grains. Common rice sold at from 18 to 14½ seers per rupee.
	19 Faridpur „ 15, '90	Nil	Weather—seasonable. Cultivation and sowing of boro, sugarcane, and jute in progress. State and prospects of wheat, barley, linseed, and other standing <i>rubbi</i> crops continue fair. Coarse rice selling at 18 seers per rupee at Madaripur and Sudder, and at 16 seers per rupee at Goalundo.
	20 Backergunge „ 15, '90	Nil	Weather—seasonable. Prospects of <i>rubbi</i> crops good. Rain wanted. Common new rice sells at 15 seers per rupee.
	21 Wymessingh „ 15, '90	Nil	Weather—seasonable; foggy on the morning of the 14th. Transplanting of boro paddy nearly over. Mustard being gathered. Standing crops in good condition. Price of coarse rice 14 seers per rupee.
Chittagong Divn.	22 Chittagong „ 15, '90	Nil	Weather—seasonable. The state of all miscellaneous crops is good.
	23 Noakhally „ 15, '90	Nil	Weather—seasonable. <i>Rubbi</i> crops doing well. Ploughing of land for <i>aus</i> crop commenced.
	24 Tipperah „ 15, '90	Nil	Weather—clear and cloudy. Transplanting of boro paddy completed. Winter crops prospering.
	25 Chittagong Hill Tracts „ 14, '90	Nil	Weather—cold and foggy in the morning throughout the week. Gathering of mustard continues. Tobacco, chillies, and other standing crops progressing.
BEHAR.			
Patna Divn.	Hill Tipperah Feb. 15, '90	Nil	Weather—getting warm. Sugarcane and tobacco still being cut. Boro paddy doing well in low places. <i>Jums</i> being cleared in the hills.
	26 Patna „ 15, '90	Nil	Weather—cool. Harvesting of mustard, pea, gram, and <i>masoor</i> going on. Other spring crops ripening. Opium has commenced to be collected in some places. Prospects favourable. Prices of food-grains almost stationary.
	27 Gya „ 15, '90	Nil	Weather—seasonable. Poppy plants in flower, and opium being extracted in places. <i>Rubbi</i> good. Mustard and <i>masoor</i> being reaped.
	28 Shahabad „ 15, '90	Nil	Weather—still cool, but getting warmer. Prospects of <i>rubbi</i> crops fair. Poppy crop promising. Prices stationary.
	29 Darbhanga „ 15, '90	Nil	Weather—days getting warm. Wheat and barley approaching maturity, and prospects continue favourable. Mustard is being harvested and expected to yield a good outturn. Poppy blossoming. Prices almost stationary.
	30 Monroepur „ 15, '90	Nil	Weather—seasonable; getting warmer. Mustard being cut. Prospects of wheat and other <i>rubbi</i> crops good. Poppy in flower, and prospects very favourable.
	31 Sarun „ 15, '90	Nil	Weather—seasonable. <i>Rubbi</i> , including wheat, continues to look well, and gives prospect of a 16-anna crop. Prospects of poppy also excellent.
	32 Champarn „ 15, '90	Nil	Weather—bright and getting dry with west wind. Prospects of all crops on the ground excellent. <i>Rubbi</i> , including wheat, has begun to ripen. Poppy is in flower. Prices almost stationary.
	33 Mueghyr „ 15, '90	Nil	Weather—seasonable. West wind prevailing. Standing crops doing well. Mustard and pulses being reaped.
	34 Bhagalpur „ 15, '90	Nil	Weather—seasonable. Prospects of crops promising, but rain wanted for <i>rubbi</i> . Outturn of mustard in the north of the district is said to have been below 12 annas.
Khouloum Divn.	35 Purneah „ 15, '90	Nil	Weather—fine and rather warm. Mustard harvested with good outturn. All <i>rubbi</i> crops doing well. Ploughing going on.
	36 Maldah „ 15, '90	Nil	Weather—getting warmer. Gathering of <i>kalai</i> and mustard almost completed. Transplanting of boro paddy continues. Prospects of <i>rubbi</i> crops continue favourable, but a shower of rain would much improve them. Common rice selling at an average of 17½ seers per rupee.
	37 Southal Perghe „ 15, '90	Nil	Weather—dry, getting hot in the day. Prospects of crops good, but rain wanted.

No.	District and date of return.	Rainfall at Sudder Station in inches.	Character of the weather and state and prospects of the crops.
ORISSA.			
Orissa Divn.	38 Cuttack	...	Report not received.
	39 Puri	.. 14, '90	Nil
	40 Balasore	.. 15, '90	Nil
CHOTA NAGPORE.			
<i>South-West Frontier Agency.</i>			
Chota Nagpore Divn.	41 Hazaribagh	Feb. 15, '90	Nil
	42 Lohardugga	.. 15, '90	Nil
	43 Singhbhum	.. 15, '90	Nil
	44 Manbhum	.. 15, '90	Nil

Published for general information.

CALCUTTA; REVENUE DEPT.,
The 18th February, 1890.P. NOLAN,
Secy. to the Govt. of Bengal.

IMPORTS INTO CALCUTTA.

* One maund of paddy is equivalent to 25 seers of rice. † Exclusive of usage obtained by local manufacture.

The Sea-borne Trade of Calcutta in these Staples during the month of November, 1888, was as follows:—

EXPORTED FROM CALCUTTA—														
To Indian ports, viz.—														
Bombay ...	1,79,000	20	1,10,000	2,941	60	1,22,000	2,430	1,40,000	21	33,167	400	685	685	100
Madras ...	...	150	167	235	16,000	16,000	...	820,000	...	...	...	...	174	10
Other ports in Madras ...	63,500	...	62,000	...	1,400	60,000	6,320	257,000	...	...	...	...	9	...
Burmah ...	2,554	...	2,550	266	12,100	23,700	...	110,000	...	30	91	120	5	...
Other Indian ports ...	1,501	...	1,501	...	1,000	...	...	172,000	...	...	1	...	1,000	...
Pondicherry and ...	70	...	...	...	...	...	...	40,000	...	...	...	...	...	...
Total of Inter-port trade ...	1,20,000	270	1,00,000	3,300	21,200	6,000	2,31,000	8,700	3,00,000	...	33,167	800	685	100
To foreign ports—														
United Kingdom ...	80,000	...	80,000	80,000	10,000	...	1,00,000	2,10,000	700,000	1,00,000	1,00,000	2,700	200	...
Other Foreign ports ...	2,00,000	0,000	2,00,000	1,000	20,000	4,000	3,00,000	4,00,000	4,00,000	60,000	70,000	6,000	32,700	1,000
Total of Foreign trade ...	2,00,000	0,000	2,00,000	1,000	20,000	4,000	3,00,000	4,00,000	4,00,000	60,000	70,000	6,000	32,700	1,000
Grand Total of Exports to Nov. 1890 ...	2,00,000	270	2,00,000	4,300	41,200	10,000	5,31,000	12,700	7,00,000	...	93,167	800	685	100

The following Statement shows the several Routes followed by the Trade in the Principal Staples of Traffic imported into Calcutta during the month of November, 1889.

IMPORTS INTO CALCUTTA.

SPECIFICATION OF ROUTES.	FOOD-GRAINS.					FIBROUS PRODUCTS.		OILSEEDS.		Tea, Indian.	Cotton, raw.	Silk, raw.	SUGAR.		TOBACCO.	
	Rice.	Paddy.	Wheat.	Gram and pulses.	Other food-grains.	Jute, raw.	Gunny-bags.	Linseed.	Mustard seed.				Drained.	Un-drained.	Manufactured.	Manu- natural.
	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	No.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.	Mds.
By country boats	2,41,090	41,043	43,456	92,065	8,980	7,64,215	293,187	51,443	60,231	...	3,960	163	3,681	26,631	7,422	2,000
By river steamers	33,509	750	8,660	3,310	...	2,03,328	...	36,324	10,341	1,05,926	1,700	79	...	474	...	...
By East Indian Railway	1,84,394	23,425	1,53,139	1,30,995	16,731	24,700	23,215	1,55,753	23,364	2,641	60,001	745	...	19,435	293	361
By Eastern Bengal State Railway	2,715	...	1,954	14,365	190	11,19,235	1,036,125	1,008	1,280	40,507	300	306	...	2,046	8,190	...
By road	25,544	1,572	...	...	...	1,01,235	37,300	...	...	...	181	...	790	1,408	27	623
By sea	22,572	4,746	...	11,980	...	8,473	23,575	1,804	504	2,182	6,026	5	27,352	...	62	552
Grand total of 1889	5,10,783	71,385	2,06,740	2,43,613	94,917	23,23,180	1,417,603	2,16,178	2,06,700	1,51,154	72,807	1,890	31,336	40,630	17,048	3,823
Imports in November	10,22,743	1,23,036	2,76,963	3,56,860	61,321	34,54,873	2,025,370	5,58,672	92,049	1,45,650	66,749	3,018	13,333	79,007	12,302	12,744

The following Statement shows the Values, Quantities, and Numbers of the Principal Staples of Traffic exported Inland from Calcutta during the month of November, 1889.

EXPORTS FROM CALCUTTA.

Whither exported.	Cotton piece-goods.		Cotton twist.		Salt.	Gunny-bags.	Whither exported.	Cotton piece-goods.		Cotton twist.		Salt.	Gunny-bags.
	European.	Indian.	European.	Indian.				European.	Indian.	European.	Indian.		
	Rs.	Rs.	Mds.	Mds.	Mds.	No.		Rs.	Rs.	Mds.	Mds.	Mds.	No.
BENGAL.							CHOTA NAGPORE.						
Bardwan	3,65,696	8,750	403	1,071	36,100	44,876	Hazaribagh	87,914	6,480	...	...	5,472	...
Bombaim	1,68,147	1,310	64	787	13,790	105,662	Manbhum	77,931	6,000	...	...	1,624	...
Madras	2,74,349	...	2,431	16	18,335	19,786	Total of Chota Nagpore	1,45,845	11,500	60	1,718	10,094	1,190
Rangoon	1,13,188	8,785	469	179	2,103	24,185	Grand total of supplies into the Province under the Lieutenant-Governor of Bengal	89,83,704	40,703	17,494	26,470	7,41,230	870,110
Teheran	1,31,030	3,068	511	...	11,433	7,285	OTHER PROVINCES.						
Yokohama	3,50,015	3,794	10	...	36,700	20,739	Assam	7,75,308	...	994	703	60,332	2,395
Shanghai	80,046	...	...	...	5,792	...	North-Western Provinces	7,458	...	...	...	...	...
Calcutta	1,15,021	...	...	...	14,910	...	Punjab	40,49,182	7,480	2,254	1,377	37,063	247,270
Barisal	1,21,416	...	...	...	10,790	...	Central Provinces	8,10,269	4,070	770	...	...	251,430
Patna	1,24,142	...	...	...	17,343	...	Rajputana and Central India	23,810	730	176	...	...	23,000
Benares	2,32,679	...	...	...	7,413	17,710	Other places	40,000	...	123	...	...	3,005
Delhi	6,00,241	...	...	...	51,050	...	Grand Total of 1889	1,60,23,188	42,960	23,283	28,340	8,27,711	9,298,540
Amritsar	3,04,369	...	...	...	6,780	...	Exports in Nov. 1889	1,90,20,346	82,199	30,524	15,031	8,71,590	10,614,399
Rawalpindi	1,01,551	...	...	...	4,600	...							
Lyallpur	1,21,416	...	...	...	40,481	...							
Rawalpora	2,13,066	...	...	...	37,212	...							
Thana	10,05,039	...	1,231	204	33,000	175							
Delhi	3,66,061	...	...	...	31,448	...							
Benares	3,01,053	...	...	...	7,790	...							
Patna	2,07,316	...	...	...	200	...							
Calcutta	87,745	...	...	...	3,428	...							
Grand Total	34,07,423	21,323	11,383	2,300	6,20,000	442,876							
BIHAR.													
Patna	2,47,727	440	198	178	21,830	83,080	IMPORTED INTO CALCUTTA.						
Barisal	1,02,034	1,820	82	907	15,036	10,553	From Foreign Ports—						
Calcutta	3,71,691	9,260	89	1,111	24,553	1,540	United Kingdom	98,13,843	...	9,333	...	631,074	...
Delhi	1,08,545	...	...	...	10,775	...	Other Foreign ports	40,422	...	195	...	2,17,513	12,180
Lyallpur	3,35,081	1,560	90	1,163	24,051	26,305	Total of Foreign Trade	98,90,661	...	9,528	...	8,48,587	12,180
Rawalpindi	6,71,068	...	...	...	11,560	...	From Indian Ports—						
Rawalpora	1,01,368	...	...	...	10,780	...	Bombay	7,142	2,42,640	20	7,719	45,186	4,000
Delhi	2,53,907	1,050	63	546	26,767	55,015	Madras	960	3,069	...	...	...	...
Calcutta	2,14,635	2,900	115	760	19,410	6,850	Other ports in Madras	800	20,671	...	...	...	...
Grand Total	23,72,961	10,830	741	8,397	2,82,760	236,315	Other Indian ports	3,050	1,015	...	...	...	...
ORISSA.							Total of Interport Trade	12,632	2,60,280	20	8,021	45,186	11,423
Calcutta	27,500	...	1,536	...	2,008	14,850	Grand Total of Im- of 1889	98,73,316	3,09,929	9,577	8,021	8,63,573	83,375
Grand Total	1,12,475	...	8,391	...	17,063	70,100	Exports in Nov. 1889	1,43,30,907	7,78,185	27,612	7,756	8,92,141	68,600

* As per tariff declaration value.

The following Statement shows the several Routes followed by the Trade in the Principal Staples of Traffic exported from Calcutta during the month of November, 1889.

SPECIFICATION OF ROUTES.	COTTON PIECE-GOODS.		COTTON TWIST.		Salt.	Gunny-bags.
	European.	Indian.	European.	Indian.		
	Rs.	Rs.	Mds.	Mds.	Mds.	No.
Country boats	2,30,351	8,795	1,916	16	3,07,483	307,231
By river steamers	23,36,436	...	3,764	1,037	50,035	60,309
By East Indian Railway	26,26,023	50,100	4,038	11,400	2,71,699	2,140,315
By Eastern Bengal State Railway	26,00,817	...	6,711	...	68,078	44,075
By road	1,01,025	3,008	431	137	8,334	5,400
By sea	8,18,475	814	7,065	15,780	15,430	7,661,100
Grand Total of Exports in November	1,40,23,190	68,639	23,385	23,340	8,27,711	9,298,540
	1,90,20,346	82,199	30,524	15,031	8,71,590	10,614,399

STATISTICAL DEPARTMENT,
The 16th February, 1890.

P. NOLAN,
Secretary to the Govt. of Bengal.

I.—Table showing the Monthly and Annual Rainfall at 258 Rainfall-recording Stations in Bengal for 1889.

DISTRICT.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
ORISSA.														
POOREE	Pooree	—	0.17	—	—	1.00	12.31	10.58	21.10	4.92	13.01	17.03	0.21	80.00
	Khurda	—	0.10	0.07	0.12	1.12	14.83	12.08	16.30	8.23	11.43	10.16	—	70.00
	Bampur	—	0.21	—	—	1.20	7.7	11.34	14.71	4.55	12.50	14.46	0.14	60.02
	Paisa Point	—	2.04	—	0.05	1.14	15.18	11.48	15.79	6.10	10.40	10.38	1.04	80.38
CUTTACK.	Deep	—	0.04	—	—	—	—	11.44	10.63	3.94	10.05	—	—	—
	Jagatsinghpore	—	2.43	—	—	2.11	8.79	24.03	11.08	4.55	11.80	10.4	—	70.00
	Bhakti	0.00	1.24	0.05	0.00	0.02	11.01	7.19	13.67	3.08	8.45	7.00	—	50.00
	Cuttack	—	0.33	0.03	0.03	0.20	18.00	12.75	14.50	2.00	8.54	11.54	—	70.00
	Kendrapara	—	1.08	0.01	0.72	2.82	13.11	10.00	15.00	5.44	8.5	10.31	0.26	70.00
	Jajpore	0.31	0.05	0.10	0.58	4.82	12.65	10.28	8.00	4.74	2.03	9.30	—	60.00
BALASORE.	Dhamra	—	0.50	0.22	1.25	2.40	12.60	9.85	12.20	5.10	8.10	9.00	—	61.25
	Salapora	—	0.80	—	0.70	1.80	10.54	10.00	10.00	5.70	7.00	10.55	—	70.00
	Chandbali	—	1.30	0.30	0.80	3.43	5.06	8.72	10.12	0.48	8.30	0.00	0.12	57.54
	Bhadrach	0.50	0.38	1.0	—	5.30	7.08	11.62	12.14	2.03	4.73	0.23	—	60.00
SOUTH WEST BENGAL.	Sarab	—	1.00	0.07	1.27	5.01	4.33	8.00	8.42	5.30	6.24	0.00	—	60.00
	Balasore	—	0.72	—	1.51	4.45	4.55	4.68	11.51	4.37	12.31	0.7	—	60.00
	Jelason	—	1.00	0.08	—	1.20	8.10	5.00	8.57	4.83	0.00	4.22	—	60.00
	Baripodah	—	1.38	0.00	1.73	4.31	10.01	0.02	13.08	5.41	5.02	4.27	—	60.00
MIDNAPORE.	Contai	—	1.76	0.16	—	1.77	11.50	5.71	13.14	0.43	5.02	7.71	0.05	67.07
	Sunder Island	—	1.01	—	—	0.13	12.30	0.02	10.20	4.00	10.01	0.00	0.03	60.00
	Tundak	—	2.00	—	0.70	—	11.50	0.20	12.50	5.10	7.10	2.50	—	60.00
	Midnapore	1.07	0.00	—	1.40	2.64	0.19	7.85	13.05	7.10	2.32	4.23	—	60.00
	Chital	0.4	1.2	0.03	1.14	3.08	8.17	8.57	11.41	5.57	4.29	2.10	—	60.00
	Akrahatty	0.09	2.14	—	1.00	1.34	10.05	0.51	10.07	4.00	6.41	4.65	—	60.00
	Hera	0.03	1.77	0.15	0.14	5.45	20.50	7.40	10.57	7.30	8.01	4.05	—	60.00
	Rajshahi	1.18	4.94	0.10	—	4.07	13.11	0.15	11.42	7.85	5.34	3.14	—	67.00
24-PERSON.	Garbeta	0.28	1.20	—	—	3.10	13.30	12.18	8.00	6.02	0.75	2.43	—	67.77
	Diamond Harbour	—	1.70	0.03	1.27	5.08	1.78	10.15	15.00	5.58	5.05	5.38	0.04	60.50
	Canning Town	0.57	1.24	0.22	1.00	3.81	10.80	8.57	12.00	8.12	10.35	3.01	0.17	60.00
	Alipore Jail	0.57	2.60	1.10	2.45	3.02	11.73	12.08	8.00	5.38	8.54	3.00	—	60.00
	Barackpore	0.10	1.32	0.31	0.83	1.02	13.42	0.72	13.00	8.45	9.00	7.84	—	60.00
	Dum Dum	0.41	2.35	1.00	0.60	2.42	10.00	8.00	13.00	7.00	7.84	4.00	—	60.00
	Barnett	0.22	2.73	0.30	0.40	2.12	13.70	11.85	10.10	5.00	8.01	13.54	3.18	61.00
	Bussorhat	0.57	1.40	0.20	0.02	1.80	13.72	12.00	9.01	8.01	13.54	3.18	—	61.56
HOOGLY.	Howrah	0.15	2.63	0.05	1.18	2.10	17.05	12.07	0.00	7.28	6.53	2.02	—	64.11
	Motorsika (Oulodermah)	0.42	3.23	0.24	1.44	1.01	10.03	10.00	13.05	4.67	5.35	1.01	—	60.27
BURDWAY.	Ramapore	0.27	1.05	0.02	0.00	1.00	13.70	10.43	10.15	7.44	8.75	1.74	—	60.43
	Hooghly	0.16	1.08	0.12	1.70	1.70	8.21	8.00	7.30	6.77	2.61	2.61	—	60.40
BURDWAY.	Jehanabad	0.68	1.18	0.47	1.04	1.58	13.74	8.07	7.04	4.07	1.58	3.20	0.03	60.00
	Culina	0.73	0.07	0.31	1.04	2.72	11.35	5.05	8.87	7.55	2.41	5.77	—	60.77
	Burdwan	0.06	0.06	0.10	1.35	4.00	11.74	0.00	5.30	0.03	1.64	4.00	—	60.00
	Culina	0.00	0.06	0.43	0.84	1.00	7.32	7.74	7.03	6.01	2.41	10.02	—	60.00
BANKURA.	Kanungur	1.43	0.41	0.40	0.11	2.02	12.43	12.00	10.10	7.03	0.01	7.33	—	60.00
	Manik	1.18	1.24	0.10	0.02	4.03	9.25	13.00	6.00	12.41	2.00	8.00	—	60.74
	Bankura	0.55	0.39	0.07	1.44	3.80	14.34	10.10	8.00	6.50	3.00	4.17	—	60.74
	Hoshangpur	0.76	1.37	1.08	1.03	3.18	12.02	12.02	7.00	0.01	5.77	2.04	—	60.54
BANKURA.	Mahara	0.65	1.00	0.24	0.10	2.07	14.16	10.11	7.00	0.00	—	—	—	60.00
	Khatra	—	1.07	—	1.78	2.10	21.00	15.02	12.00	0.00	3.10	3.00	—	60.00
	Indra	0.14	0.54	0.25	1.08	4.74	14.08	11.01	5.00	6.01	1.00	3.00	—	60.00
	Kotalpur	1.80	0.03	0.00	1.20	2.10	10.00	14.00	0.00	7.00	0.00	2.00	—	60.00
	Anda	0.25	0.05	0.20	0.21	0.00	10.00	10.00	4.02	0.00	0.74	1.00	—	60.00
	Gangajalhati	0.03	1.33	0.23	0.23	3.00	11.07	13.00	0.00	10.78	3.00	2.00	—	60.00
	Barpore	—	0.73	0.45	0.00	1.42	17.17	14.02	10.43	6.00	5.00	8.00	—	60.00
	Manikhat	0.57	0.47	1.12	1.53	4.00	15.00	11.04	8.02	10.07	1.43	4.33	—	60.00
	Rh. Scory	1.1	1.11	0.33	0.03	3.00	12.00	11.01	11.02	11.01	3.00	3.00	—	61.55
	Hoshangpur	1.30	0.07	0.11	0.10	5.30	13.30	8.00	6.10	7.00	1.71	4.00	—	60.00
BIRBHUM.	Kanpur Haul	2.43	0.00	1.59	0.11	2.02	11.00	10.00	7.00	12.00	0.00	2.00	—	60.00
	Hulpara	1.45	0.75	0.40	0.18	3.00	10.00	9.01	10.70	12.74	2.47	4.00	—	60.00
	Murali	—	—	—	—	5.00	9.07	13.70	5.00	17.25	1.70	1.70	—	60.00
	Ranaghat	1.72	0.44	0.40	0.02	3.17	13.48	0.14	12.00	10.00	4.28	3.00	—	60.00
NUDDRA.	Keshabpur	1.07	0.31	0.44	0.51	1.51	9.00	8.00	4.50	5.11	4.43	8.00	—	60.00
	Choudaga	0.04	0.00	0.05	0.70	1.00	8.00	8.00	7.00	10.00	8.72	10.00	—	60.00
	Maharajpur	2.12	0.87	2.21	7.39	5.21	10.42	7.10	11.30	11.30	0.00	5.30	—	60.00
	Koushten	0.57	0.70	—	0.03	2.83	14.07	10.11	0.15	10.00	1.01	5.30	—	60.44
KHOULNA.	Saikhira	0.00	0.01	1.05	0.74	1.40	11.28	11.10	0.31	0.54	0.35	3.00	0.01	67.00
	Barisal	0.20	0.78	0.27	3.40	0.70	14.00	10.00	0.00	5.23	10.40	1.00	—	60.00
	Khousha	0.55	0.40	0.04	2.73	0.44	11.28	8.00	0.30	10.01	11.30	3.00	0.08	60.00
	Nakipur	—	—	—	—	—	—	—	—	—	—	—	—	—
JESSORE.	Narail	0.73	1.00	0.00	2.72	3.10	11.45	0.10	8.00	6.00	7.10	5.10	—	60.00
	Jessore	0.60	0.00	0.00	2.02	2.14	14.18	0.00	7.17	0.00	7.00	7.00	—	60.00
	Shandah	0.60	0.00	0.15	0.00	3.00	10.33	7.43	8.55	0.00	4.00	8.00	—	60.00
	Mogura	0.65	0.30	0.27	2.01	3.20	15.70	0.00	8.00	2.00	7.21	0.00	—	60.00
	Bongora	0.65	0.00	0.57	0.02	1.25	0.71	11.18	6.00	4.47	0.01	3.00	—	60.00
MOONSHI.	Kandi	0.05	0.00	0.00	0.10	4.00	10.12	0.57	8.01	0.75	0.51	5.70	—	60.00
	Bherampore	1.30	0.00	0.20	—	7.74	10.11	7.00	6.07	0.27	1.31	5.01	—	60.00
	Bairhat	1.48	0.01	0.10	0.00	4.00	5.00	5.78	12.27	7.00	0.00	2.43	—	60.00
	Azimungo	2.41	0.02	—	1.40	4.00	8.00	10.00	5.00	12.71	0.00	—	—	60.00
	Jamshedi	2.07	1.00	0.00	1.47	3.20	12.01	13.00	6.00	15.00	3.10	0.00	—	60.00
	Barisal	2.34	1.14	0.00	0.00	4.75	17.81	13.82	6.00	13.00	2.30	1.00	—	60.00
EAST BENGAL.	Jamshedi	1.08	0.01	0.15	0.00	4.00	7.04	0.00	6.00	12.00	0.00	2.00	—	60.00
	Azimungo	2.36	1.41	—	—	2.73	10.24	12.00	8.00	10.00	1.00	2.00	—	

DISTRICT.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
EAST BENGAL—concluded.														
NOAKHOLLY ...	Noakholly	—	1'55	3'12	1'06	6'07	25'41	20'42	23'13	18'25	6'81	3'54	0'1	169'68
	Penny	—	1'45	3'45	5'67	4'05	16'15	27'83	16'17	0'05	2'04	2'44	0'40	89'80
	Harihpore Bamunaj	0'13	0'84	0'56	0'5	3'00	8'24	20'43	26'81	23'88	1'58	0'47	—	89'80
FARAKKOPUR ...	Ramganj	0'13	1'54	0'87	1'20	3'26	23'23	23'05	18'00	15'24	5'13	1'01	—	82'25
	Madaripore	0'40	0'66	0'40	1'09	3'24	17'76	0'52	10'77	6'11	0'00	5'94	0'06	64'31
	Furkadipore Gostundo	0'70	0'62	0'34	3'41	3'02	18'10	12'74	11'87	0'00	4'00	7'21	—	63'89
Dacca	Gostundo	0'97	0'22	0'10	3'58	7'02	17'30	9'40	0'25	5'06	5'75	7'67	—	65'19
	Monahingunge	0'45	0'10	0'00	3'28	5'42	20'41	14'39	13'21	8'54	0'00	4'05	—	85'00
	Dacca	0'34	0'00	0'11	2'42	6'08	23'46	14'45	11'05	8'50	7'30	3'59	—	80'28
Dacca	Naraingunge	0'39	1'04	0'03	2'83	11'06	20'25	14'58	16'02	9'10	2'01	5'78	—	88'49
	Manikgunge	1'00	0'20	—	1'08	7'24	17'89	15'04	12'01	5'59	5'40	5'02	—	73'11
	Jaydebore	0'37	0'24	0'01	3'00	10'77	18'50	12'80	14'07	8'07	5'37	3'05	—	78'48
BILL TIPPERAH ...	Agartola	0'42	0'52	—	7'27	7'78	12'18	4'44	4'79	7'49	5'37	3'23	—	66'48
	Comilla	—	1'26	—	6'33	7'23	21'83	10'40	0'84	0'33	7'44	2'51	—	76'16
	Chandpur	0'68	1'04	0'00	0'9	3'03	12'50	11'51	13'38	11'01	11'08	3'40	—	70'91
TIPPERAH	Brinmamburia	0'30	0'07	—	0'59	0'00	16'06	10'37	3'21	8'21	7'42	1'63	—	61'07
	Kamakhya	0'02	0'03	0'05	3'42	4'83	21'67	0'08	5'20	0'01	10'41	5'03	—	65'72
	Nasirpur	0'35	0'40	0'30	4'44	7'05	11'05	2'85	2'50	4'14	3'09	1'20	—	59'78
Dacca	Dandakandi	—	—	0'03	1'70	0'50	2'00	7'80	0'07	4'13	3'45	3'20	—	57'19
	Kasba	0'32	0'05	0'41	0'04	0'20	14'25	8'00	4'77	17'02	11'35	2'16	—	71'46
	Laksham	—	2'29	1'10	3'00	1'70	15'85	16'05	1'03	12'07	4'35	3'44	—	75'38
MYMENSINGH ...	Kishoregunge	0'00	0'21	—	7'03	6'03	13'10	13'10	12'50	12'57	4'58	1'00	—	81'68
	Atia (Tangail)	1'04	0'24	—	1'40	12'00	16'8	11'20	11'50	7'30	2'70	4'50	—	76'26
	Mymensingh	0'57	0'21	0'03	4'40	7'23	24'01	20'41	20'71	16'22	8'17	2'14	—	102'5
MYMENSINGH ...	Jamunapara	1'04	0'49	—	0'02	4'03	27'52	13'50	11'07	16'74	8'07	1'02	—	80'30
	Netrokona	0'31	—	0'28	6'34	0'00	38'04	28'70	22'00	18'21	11'00	2'57	—	137'71
	Shermukhali	1'32	0'08	0'03	2'04	4'20	15'50	12'27	8'74	7'54	8'03	2'52	—	68'04
Dacca	Thangapara	1'00	0'20	—	0'01	11'41	47'63	35'03	31'33	24'00	3'10	0'60	—	102'03
	Shorepore Town	1'06	0'45	—	3'1	4'74	22'95	10'40	11'30	20'42	2'53	0'67	—	94'53
	Dewanganj	1'04	—	—	2'00	2'13	—	10'00	0'02	11'42	0'72	0'03	—	—
NORTH BENGAL.														
FARAKKOPUR ...	Pabna	0'53	0'64	0'04	2'20	3'04	15'27	7'20	7'00	0'02	1'01	8'40	0'04	66'71
	Seragunge	2'12	0'20	—	0'04	0'04	8'24	13'30	11'00	0'03	7'40	8'20	0'13	64'44
BOGRA	Shorepore	1'4	1'09	0'03	0'59	2'68	14'12	10'06	15'01	—	3'00	1'40	—	67'47
	Noakhilla	1'44	1'16	0'08	1'34	4'77	21'41	8'15	8'14	1'20	1'24	1'00	—	60'31
	Bohra	2'02	0'44	—	—	1'15	24'14	16'40	8'25	10'00	1'34	1'20	—	73'25
RAJSHAHY	Pauchibibi	3'23	0'55	—	—	0'66	28'03	8'30	5'04	17'45	4'07	0'47	—	68'74
	Beaulah	1'78	1'01	0'08	0'10	2'28	15'25	0'30	4'10	11'74	1'04	2'44	—	50'26
	Natore	2'70	0'35	—	1'28	0'56	21'71	14'45	7'20	5'02	2'00	3'24	—	60'41
RAJSHAHY	Nagaura	2'81	1'00	—	0'03	0'78	19'00	10'01	0'06	17'50	2'35	0'00	—	62'20
	Lalpara	0'08	0'50	—	1'02	0'00	1'04	0'04	8'03	4'00	1'30	3'03	—	40'07
	Manda	3'00	0'30	—	—	1'50	17'28	0'06	4'25	8'03	4'12	0'08	—	40'47
MALDAH	Maldah	3'09	0'30	—	—	1'28	10'01	8'34	5'71	19'71	3'03	0'03	—	56'00
	Chumna	2'14	0'00	0'03	—	0'13	10'01	0'06	2'30	11'08	0'20	0'16	—	51'02
	Gajol	2'30	0'00	—	—	0'43	7'50	8'01	4'03	16'05	2'50	Nil	—	43'33
DINAPOUR	Sibpur	2'00	0'30	0'07	0'32	2'22	14'00	8'77	0'03	15'00	5'22	1'70	—	55'21
	Mohadehpore	3'24	0'44	0'01	—	0'03	19'40	8'81	7'08	11'77	2'07	0'05	—	57'43
	Churaman	3'10	1'72	—	—	0'21	11'15	13'74	7'03	14'51	0'16	0'42	—	50'04
DINAPOUR	Raigunge	3'04	1'34	0'02	—	0'10	13'00	11'42	11'02	14'45	1'27	Nil	—	50'04
	Dinapore	2'42	0'67	—	—	1'05	28'73	11'02	12'00	18'22	0'42	Nil	—	70'01
	Balokhal	2'05	0'51	—	—	1'02	19'40	8'34	0'02	20'57	4'05	0'20	—	66'74
DINAPOUR	Thakurgram	2'47	0'57	0'20	0'08	0'03	35'43	22'07	9'08	17'02	1'27	0'05	—	91'00
	Bhawanigunge (Oyaband)	2'79	0'51	—	1'09	5'00	30'06	12'05	11'54	10'35	1'71	0'20	—	92'08
	Bhojpur	2'78	0'03	0'40	2'83	2'61	29'00	16'53	11'00	11'78	1'00	0'04	—	81'46
BHOJIPUR	Kurigram	2'36	0'01	0'25	3'00	5'00	36'25	16'05	9'43	23'08	Nil	Nil	—	80'60
	Baidgra (Niphamari)	2'24	1'03	0'03	3'04	1'03	28'05	22'07	10'05	14'00	0'76	Nil	—	94'06
	Ulipore	1'50	0'78	0'05	2'10	4'03	35'19	18'11	9'00	17'41	Nil	Nil	—	61'86
JULPIGUR	Julpigore	2'40	0'58	—	1'13	0'50	33'31	28'38	23'17	20'2	1'00	1'03	—	120'40
	Atipore (Jagat)	1'08	1'0	3'14	0'53	0'37	27'30	40'00	27'80	18'11	1'00	Nil	—	133'08
	Falacatta	1'70	0'00	0'46	4'08	10'05	12'03	47'72	3'48	14'43	4'45	0'16	—	138'8
JULPIGUR	Dibpur	2'25	1'00	—	1'40	3'03	27'05	28'07	18'45	12'00	0'02	0'5	—	96'11
	Raigatpore (Nagratatto)	1'08	1'02	2'31	2'78	10'09	37'04	37'78	31'07	15'00	7'20	0'22	—	140'03
	COOCH BEHAR ...	Dinhat	2'10	1'10	0'00	2'44	0'01	28'03	21'11	14'00	24'04	1'00	0'13	—	106'41
Cooch Behar		2'02	2'05	0'15	2'25	10'00	27'07	41'47	20'70	16'10	2'45	0'40	—	180'35
Mohligunge		1'88	2'47	0'15	1'07	3'70	30'74	34'42	28'85	14'58	1'44	0'15	—	128'07
COOCH BEHAR ...	Matabhanga	1'72	1'05	1'11	1'21	10'03	25'18	49'05	22'17	11'34	1'01	0'21	—	120'70
	Bura	2'24	2'70	0'25	2'00	17'70	37'71	71'12	38'70	23'12	0'20	0'71	0'01	811'45
	Singuri	2'06	1'00	2'00	2'21	4'00	31'33	41'71	18'00	20'04	2'00	1'07	—	122'46
DURGALING HILL ...	Durgaling	2'05	2'05	0'00	2'40	5'00	31'55	35'00	20'00	14'48	2'00	0'15	—	138'84
	Kalipong	2'02	3'00	1'7	2'30	4'05	30'44	34'07	15'00	11'21	3'10	0'47	—	102'31
	Karwong	?	?	?	?	?	33'77	71'87	30'45	10'20	3'34	0'07	—	—
NORTH BEHAR ...	Kisongunge	1'08	0'20	—	0'47	3'14	31'81	30'24	11'02	25'03	0'20	Nil	—	103'03
	Arraiah	2'10	0'30	—	—	1'24	20'07	10'03	14'00	17'17	Nil	Nil	—	82'16
	Purneah	2'38	0'37	0'01	—	2'08	11'41	10'07	9'20	18'88	1'31	Nil	—	66'41
PURNIAH	Gondwara	2'08	—	—	—	1'00	—	—	0'51	11'03	2'70	Nil	—	52'46
	Balarampore	2'00	0'75	—	—	0'40	14'18	14'07	3'00	13'75	1'60	Nil	—	—
	Mithari	2'41	—	—	—	0'78	34'00	28'01	10'03	14'70	0'23	0'03	—	—
NORTH BEHAR ...	Kaliganj	1'02	0'30	—	0'38	—	27'51	18'18	19'25	1'58	0'05	—	—	—
	Maddapore	4'17	1'28	—	—	1'05	14'37	17'30	8'04	17'44	1'45	Nil	—	60'30
	Nasipal	3'37	1'41	td										

DISTRICT.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
NORTH BENGAL—contd.														
	Gopalgunge ...	3.29	1.78	0.30	—	0.21	6.55	9.02	4.84	12.11	Nil	0.35	—	40.82
	Bawan ...	2.60	1.01	0.75	—	1.14	12.55	10.89	9.03	8.87	Nil	1.07	—	44.06
SARUN	Chuprah ...	0.00	1.13	0.34	—	0.27	7.76	13.88	7.08	1.004	Nil	1.21	—	46.90
SOUTH BENGAL.														
	Mutar ...	1.33	1.22	0.04	—	0.19	0.81	16.89	11.09	6.00	1.02	2.44	—	50.99
	Dhokra ...	0.49	1.01	1.10	—	0.25	6.27	7.22	19.31	7.00	2.34	0.87	—	45.31
SHAHABAD	Bhikmah ...	0.50	0.80	0.75	—	0.20	1.80	10.55	16.05	0.85	1.11	1.80	—	40.31
	Sesam ...	0.50	0.80	1.22	—	0.21	3.10	6.30	16.24	3.07	1.03	0.44	—	31.79
	Arak ...	1.44	1.05	0.18	—	0.00	8.28	13.58	13.08	5.15	0.02	0.18	—	46.80
OTA	Mohania ...	0.00	1.20	0.21	—	Nil	2.80	—	7.00	6.55	1.80	1.50	—	—
OTA	Aurungabad ...	0.65	0.90	0.27	0.14	0.03	3.00	9.24	17.03	3.46	0.41	0.39	—	37.35
	Gya ...	0.72	3.15	0.30	—	Nil	12.06	10.75	10.66	4.12	1.19	0.3	—	45.90
	Nowadah ...	2.12	0.50	0.30	—	0.14	11.40	10.87	11.01	4.80	1.16	0.00	—	42.03
OTA	Jehanabad ...	1.80	1.08	0.35	—	0.27	7.17	8.04	12.86	4.80	0.30	0.39	—	37.33
	Arak ...	0.03	1.04	0.33	—	0.30	5.75	14.15	9.00	4.80	0.07	0.32	—	37.43
	Imadnagar ...	0.40	0.45	—	—	0.00	4.23	8.11	10.20	3.46	Nil	Nil	—	37.23
OTA	Sherrghat ...	1.41	1.10	—	—	0.00	9.10	6.54	6.63	5.41	1.40	Nil	—	31.20
	Rajauli ...	0.10	0.55	—	—	0.10	3.32	0.40	3.80	3.10	0.20	0.50	—	18.27
	Pakra Barwan ...	1.00	0.65	0.20	—	1.70	9.46	11.48	4.90	4.31	Nil	Nil	—	33.75
PATNA														
PATNA	Patna ...	2.12	1.22	0.25	—	2.80	14.29	8.84	9.40	15.70	0.05	0.23	—	55.38
	Dimapora ...	2.00	1.21	0.35	—	0.74	10.81	13.57	10.22	10.40	0.04	0.16	—	49.07
	Behar ...	1.80	2.08	—	—	1.08	11.63	10.45	11.40	8.44	0.36	0.18	—	46.60
PATNA	Barr ...	3.13	2.71	0.20	—	2.00	8.20	12.21	7.07	4.79	0.41	0.10	—	41.97
	Barh ...	1.30	0.60	0.15	—	0.60	6.60	13.86	15.35	6.35	Nil	0.33	—	40.33
	Barh ...	1.80	2.19	0.25	—	2.83	11.65	6.63	8.13	6.12	0.06	0.12	—	39.86
MOHURYS														
MOHURYS	Beegunpur ...	3.15	2.36	0.16	—	2.51	8.81	15.27	6.81	16.67	0.45	0.10	—	53.26
	Manchyr ...	2.30	0.92	0.10	—	0.74	10.24	8.07	11.09	11.54	Nil	Nil	—	41.00
	Jamui ...	2.48	1.04	0.17	—	2.01	10.80	10.58	8.79	9.09	Nil	0.21	—	46.17
MOHURYS	Gyri ...	0.45	0.63	0.09	—	1.35	12.65	13.02	19.17	13.70	Nil	Nil	—	50.36
	Shakpore ...	1.45	1.10	—	—	0.60	10.31	14.12	11.27	7.02	Nil	Nil	—	46.07
OTTI SHA- GULFUR.														
OTTI SHA- GULFUR.	Shagulpore ...	2.03	1.70	—	—	1.61	13.96	11.20	8.30	9.97	Nil	0.04	—	48.70
	Harka ...	3.34	0.79	—	—	1.27	10.35	10.01	5.44	10.54	0.46	0.20	—	43.47
	Kulpang ...	2.32	1.14	—	—	3.91	10.53	9.70	11.35	11.20	0.00	0.02	—	50.43
OTTI SHA- GULFUR.	Bangson ...	?	?	?	?	?	?	11.20	15.45	14.71	Nil	Nil	—	—
SOUTH PERS- GURHAR.														
SOUTH PERS- GURHAR.	Rajmehar ...	2.34	0.83	—	—	1.63	14.00	12.52	13.86	17.03	1.72	0.30	—	63.06
	Godia ...	3.95	0.88	—	—	4.59	14.10	8.33	4.25	11.01	2.44	0.73	—	53.67
	Pakour ...	2.82	0.78	0.04	0.49	2.25	12.40	11.15	9.43	20.14	7.45	0.91	—	77.94
SOUTH PERS- GURHAR.	Nya Isomha ...	2.62	1.14	0.10	0.50	4.16	11.01	17.49	8.06	8.71	4.22	2.53	—	60.00
	Isomha ...	1.46	0.45	0.17	—	0.57	3.00	1.35	8.22	10.13	2.40	1.90	—	42.61
	Isomha ...	1.82	0.51	0.00	0.34	0.56	9.2	10.69	8.86	10.05	3.27	3.74	—	42.63
SOUTH PERS- GURHAR.	Jamhara ...	1.41	2.45	—	—	1.40	12.47	15.21	8.81	20.09	1.60	0.18	—	61.73
	Mohapama ...	0.84	0.65	—	—	1.70	5.75	4.96	4.79	6.02	0.70	0.45	—	23.56
	Namhat ...													
CHUTIA NAGPUR.														
CHUTIA NAGPUR.	Pachamba (Girdi) ...	1.45	1.20	0.35	0.35	1.70	8.60	7.73	18.09	8.79	0.90	1.40	—	48.01
	Hazaribagh ...	0.44	0.92	0.36	0.42	0.93	10.06	12.23	13.51	7.72	3.6	1.49	—	51.50
	Serantapur ...	0.77	0.77	0.41	1.11	1.15	0.70	12.04	8.53	7.33	1.14	1.15	—	39.30
HAZARIBAGH...	Mahudi Hills ...	1.21	0.79	0.06	0.67	2.44	14.58	10.34	10.88	0.26	1.61	—	—	—
	Jhousa Hills ...	1.20	1.05	—	—	1.10	10.80	9.80	10.80	7.70	0.50	2.80	—	48.78
	Barhi ...	0.08	1.05	0.24	—	0.45	6.56	8.2	6.05	7.34	2.21	0.30	—	37.40
HAZARIBAGH...	Chakra ...	0.30	3.81	0.20	0.18	1.40	12.47	15.04	9.28	4.85	4.45	0.71	—	50.35
	Kanagdeha ...	2.00	0.05	0.12	—	1.10	13.50	6.70	6.13	8.70	0.70	3.10	—	45.12
	Ranghar ...	—	—	—	—	Nil	—	—	—	11.07	—	—	—	—
LOHARDUGGA														
LOHARDUGGA	Lohardugga ...	0.54	1.79	0.70	0.54	0.70	8.12	7.61	15.87	9.88	2.63	0.43	—	48.90
	Ranchur ...	0.00	0.75	0.30	0.70	0.72	10.52	10.54	10.10	6.33	3.26	1.83	—	55.43
	Pasmow ...	1.47	0.85	0.35	0.22	1.60	5.96	7.40	7.33	6.65	4.53	0.01	—	36.64
LOHARDUGGA	Nila ...	—	0.70	0.10	0.60	1.00	6.70	3.30	12.40	7.50	1.50	—	—	—
	Bahmat ...	1.60	0.15	0.61	0.53	0.31	4.22	13.22	15.13	6.90	1.80	Nil	—	47.80
	Gargab ...	0.25	0.50	0.6	0.20	0.45	4.75	11.09	2.00	2.50	0.40	—	—	—
SINGBHOOM														
SINGBHOOM	Chakmara ...	0.21	0.53	0.32	1.10	1.06	16.37	8.79	13.55	2.81	3.84	2.44	—	50.81
	Chakmara ...	—	1.1	—	0.85	2.5	7.18	7.79	11.04	7.50	9.13	2.06	—	43.37
	Chakmara ...	0.20	0.35	—	0.94	0.96	11.92	10.67	20.03	7.35	3.06	4.09	—	50.44
SINGBHOOM	Bakaragura ...	—	2.50	1.27	—	1.97	12.53	8.77	9.77	13.03	4.43	3.00	—	57.87
SINGBHOOM	Purnia ...	0.28	0.67	0.10	1.20	1.08	11.19	10.87	8.26	7.44	1.22	2.80	—	65.40
	Gotadipore ...	0.77	0.84	0.47	0.11	1.43	8.20	8.50	6.13	6.00	0.57	1.60	—	36.13
	Englunathpore ...	0.53	0.10	0.40	0.04	1.55	8.75	13.00	9.07	7.70	0.52	0.27	—	44.78
SINGBHOOM	Barrabhoom ...	—	0.05	0.63	1.03	2.30	9.40	12.44	9.61	6.73	0.46	4.29	—	47.33
	Jhalda ...	—	—	—	—	0.89	16.93	6.19	19.03	6.01	0.78	1.97	—	—
	Chas ...	—	—	—	—	0.29	16.89	11.19	14.95	10.52	1.76	2.98	—	—

METEOROLOGICAL OFFICE, BENGAL,
The 18th February 1890.

A. PEDLER,
Meteorological Reporter to the Government of Bengal.

11.—Table showing the Monthly and Annual Average Rainfall at 169 Rainfall-recording Stations in Bengal.

DISTRICT.	STATION.	Number of years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
ORISSA.															
POOREE	Pooree	31-34	0.26	1.10	0.37	0.86	2.00	7.56	9.91	10.93	9.03	8.96	2.10	0.73	84.69
	Khandah	18-19	0.27	0.72	0.42	0.70	3.34	9.16	12.56	12.56	10.30	8.60	1.81	0.50	89.31
	Baupur	10-11	0.99	0.88	0.72	0.96	2.00	7.14	10.93	12.11	8.30	0.50	8.09	1.8	64.16
CUTTACK.	Paine Point	21-22	0.28	0.88	1.10	2.10	3.03	8.92	14.15	13.06	11.14	10.27	2.24	0.64	69.44
	Jagatsingapore	14-15	0.35	0.6	0.81	0.72	2.76	7.54	10.98	11.37	8.61	6.47	1.34	0.89	51.08
	Bhakti	7-8	0.25	0.73	1.28	0.30	1.01	10.12	11.37	14.01	8.09	4.01	2.93	0.71	82.45
BALASORE.	Cuttack	28-31	0.40	0.50	1.00	1.41	3.07	1.50	12.10	11.64	9.70	5.05	1.07	0.44	88.09
	Kendrapara	18	0.44	0.74	0.82	1.00	3.04	8.92	11.70	13.24	9.14	5.94	0.65	0.46	87.10
	Jajpore	10-15	0.41	1.31	1.13	1.81	4.36	9.52	13.19	11.74	9.94	5.12	0.76	0.71	69.60
SOUTH-WEST BENGAL.	Chandab	15-16	0.48	1.02	1.09	1.02	4.00	7.33	11.83	11.90	11.04	0.60	1.28	0.84	89.40
	Bhandrak	18-19	0.30	1.32	1.38	1.49	5.17	8.49	12.00	11.22	10.50	4.43	0.99	0.37	89.40
	Sowah	16-16	0.21	0.84	0.63	1.41	4.00	6.54	11.05	11.45	11.15	5.24	0.85	0.13	86.08
MIDNAPPORE.	Balason	22-30	0.73	1.27	1.70	3.00	4.97	8.87	11.09	12.78	12.03	6.70	1.05	0.26	80.74
	Jellason	15-16	0.72	1.02	0.99	1.41	3.04	7.71	15.10	11.45	10.98	4.94	0.42	0.11	87.19
	Hatipeda	11	0.28	0.80	1.21	1.39	4.91	10.16	12.77	12.45	11.11	3.93	0.19	0.20	69.19
DIHPUR.	Chital	20-22	0.31	1.38	1.17	1.61	4.42	10.92	14.41	14.22	11.74	8.08	1.02	0.44	66.08
	Sanger Island	21-22	0.33	1.17	1.35	1.51	4.47	10.90	15.98	16.01	12.26	9.00	0.81	0.44	74.21
	Tumuck	18	0.38	1.10	1.77	1.64	4.00	8.00	12.23	14.60	9.53	4.19	0.14	0.20	89.45
HAWDAH.	Midnapore	23-25	0.72	0.84	1.41	1.64	5.29	0.52	13.00	12.57	8.19	4.92	0.32	0.24	89.24
	Chitala	12-13	0.61	0.80	1.09	1.81	5.14	9.79	13.62	14.05	8.98	3.22	0.15	0.27	62.15
	Chitala	8-10	0.56	1.08	1.46	2.03	4.00	7.44	10.37	14.20	9.04	2.43	0.61	0.19	66.28
BURDWAN.	Diamond Harbour	18-19	0.61	1.08	1.44	2.32	4.00	8.85	14.68	15.00	11.01	5.05	0.38	0.27	60.66
	Alipore Jail	18-19	0.71	1.47	1.09	1.81	5.29	0.70	13.07	14.22	9.90	4.39	0.42	0.33	61.30
	Barrackpore	18-19	0.66	1.27	1.74	1.81	5.17	8.80	12.49	11.57	7.44	3.33	0.59	0.40	66.45
BOGHLEY.	Dum Dum	18-19	0.72	1.12	1.67	2.03	2.91	0.60	12.18	11.00	8.19	4.28	0.30	0.30	66.49
	Harnet	18-19	0.59	1.20	1.57	2.04	5.14	0.60	11.21	12.51	9.12	4.36	0.30	0.29	66.80
	Harnet	18-19	0.42	1.04	2.18	2.13	0.30	10.09	12.82	15.23	8.70	4.79	0.37	0.22	61.44
BANKURA.	Harnet	18-19	0.59	1.20	1.57	2.04	5.14	0.60	11.21	12.51	9.12	4.36	0.30	0.29	66.80
	Mohoreka (Undoubtedly)	13-14	0.51	1.41	1.18	1.47	5.08	10.67	13.60	13.34	9.10	4.15	0.41	0.27	61.36
BIRBHUM.	Sernampore	17-18	0.42	1.24	1.30	2.00	4.06	9.52	13.13	12.90	7.90	4.10	0.40	0.30	69.23
	Hogobly	24-25	0.45	1.38	1.77	2.71	7.44	10.39	12.22	13.00	7.43	3.95	0.40	0.26	69.40
	Jamshaid	17-18	0.39	1.27	1.16	1.91	5.07	9.29	12.88	16.66	9.62	4.18	0.26	0.19	62.34
KHOOLNA.	Culna	14-19	0.46	1.08	1.39	2.30	4.78	8.96	11.20	10.00	0.54	3.74	0.68	0.21	52.85
	Barwan	28-29	0.31	0.77	1.30	2.24	0.05	0.37	12.1	12.38	8.28	4.40	0.57	0.17	57.19
	Culna	14-19	0.45	1.16	1.29	1.80	5.37	0.00	10.40	12.69	8.20	3.63	0.31	0.10	51.00
JAMSHAI.	Bankura	31-34	0.37	1.08	1.41	1.01	3.42	0.08	12.78	12.30	8.84	4.12	0.45	0.17	53.41
	Bishnupore	10-11	0.47	1.37	1.60	4.90	10.01	12.12	15.12	10.10	0.10	2.71	0.37	0.24	68.43
	Mahara	9-10	0.35	0.67	0.67	0.87	3.46	0.14	13.64	14.94	0.52	1	0.21	0.21	60.36
BIRBHUM.	Khatra	9-10	0.40	0.60	1.14	0.83	3.33	11.41	13.01	14.17	10.08	3.71	0.80	0.42	61.73
	Rupur	10-11	0.32	0.85	1.17	0.83	4.00	8.71	11.79	10.74	8.90	3.55	0.66	0.30	57.74
BIRBHUM.	Birbhumi	26-29	0.46	0.92	0.97	0.84	3.20	10.10	12.04	13.17	9.77	3.59	0.14	0.16	63.89
	Hetampore	13-14	0.51	0.97	0.45	1.13	3.28	10.02	14.84	14.13	10.32	2.71	0.70	0.12	68.09
	Rangpore Hant	16	0.55	0.84	0.71	1.32	3.47	9.35	11.13	14.55	11.22	3.09	0.21	0.18	60.65
NEDDA.	Kanagunge	19	0.33	1.19	0.65	1.26	3.09	8.43	14.08	13.64	7.14	3.21	0.21	0.14	63.06
CHITTAGONG.	Ranaghat	18-19	0.46	0.93	1.23	2.00	5.08	0.40	10.88	13.00	6.95	3.64	0.40	0.22	51.47
	Kishorepur	23-24	0.41	1.02	1.25	2.47	0.96	0.52	10.82	11.80	7.44	4.53	0.40	0.15	51.63
	Chandab	14-19	0.31	1.11	1.88	1.83	7.35	8.06	10.00	12.60	0.84	4.35	0.30	0.13	60.37
KHOOLNA.	Mohoreka	18-19	0.31	1.02	1.16	2.03	5.88	0.30	10.11	12.60	7.02	3.51	0.30	0.18	60.24
	Kooshita	19	0.38	1.11	1.87	3.01	7.00	10.66	11.02	11.60	0.96	4.73	0.20	0.19	62.11
JAMSHAI.	Bakira	18-19	0.40	0.93	2.50	2.03	5.08	12.05	13.41	13.38	8.71	4.45	0.40	0.34	64.40
	Bago hat	17-18	0.39	1.31	1.32	3.06	0.60	12.78	14.80	12.80	0.70	5.03	0.40	0.27	60.65
	Khoorna	17-18	0.60	1.23	2.10	3.21	0.38	12.64	12.60	12.24	0.38	4.07	0.42	0.32	64.83
JAMSHAI.	Narail	17-18	0.68	1.16	1.94	3.22	0.30	10.82	0.69	10.53	7.08	3.14	0.30	0.23	51.93
	Jamshai	29-34	0.5	0.85	2.14	4.44	7.40	10.13	11.70	11.70	3.26	5.30	0.37	0.19	67.61
	Jamshai	17-18	0.34	1.10	2.10	3.86	0.47	12.60	0.75	12.35	8.71	4.58	0.31	0.17	62.00
MOORHEDA.	Magoora	17-18	0.31	1.05	2.23	3.96	7.78	11.45	10.28	9.07	7.00	5.05	0.29	0.18	67.72
CHITTAGONG.	Bogang	10	0.38	1.10	1.79	2.74	5.64	0.03	11.20	12.07	8.34	4.00	0.34	0.34	59.01
	Kandi	13-14	0.42	0.85	0.67	1.46	4.10	0.30	12.02	11.75	8.87	3.70	0.42	0.25	55.27
	Serampore	24-26	0.44	0.95	1.15	1.92	4.97	0.40	10.91	10.91	0.00	5.90	0.33	0.12	53.30
EAST BENGAL.	Lalpur	18	0.50	0.80	0.99	1.21	4.91	0.80	10.63	12.71	10.72	4.96	0.30	0.10	60.72
	Arumpong	10-17	0.56	0.76	0.33	1.32	4.60	8.00	10.71	12.68	9.55	4.02	0.30	0.10	60.72
	Jamshai	18	0.41	0.95	1.20	4.82	5.51	10.17	11.79	10.94	3.11	4.11	0.11	0.14	63.49
CHITTAGONG.	Lalpur	15-16	0.61	0.85	0.96	1.31	0.40	9.04	11.24	11.47	0.71	4.13	0.22	0.14	64.84
CHITTAGONG.	Chit' Bangor	18-19	0.77	0.49	1.82	2.53	10.35	32.00	41.00	28.00	10.71	7.88	2.51	0.30	143.86
	Chit' Bangor	20-34	0.61	1.10	1.01	4.82	0.19	23.08	22.18	21.10	13.75	5.00	1.50	0.57	106.87
												</			








DISTRICT.	STATION.	Number of years.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
NORTH BENGAL.															
POONA	Poona	25-27	0.39	1.13	1.77	3.11	6.81	11.84	10.71	12.47	11.00	4.67	0.23	0.11	61.90
	Sherpunge	18-19	0.40	1.01	1.33	2.78	7.81	11.10	10.05	11.32	9.43	4.39	0.37	0.14	60.96
BOGRA	Sherpore	10-13	0.35	0.90	1.44	1.54	6.47	11.71	12.71	12.30	9.04	8.95	0.41	0.22	61.17
	Nowkhilla	15-13	0.34	0.85	1.21	1.99	7.79	12.61	11.47	10.80	8.43	4.76	0.34	0.16	61.09
	Bogra	20-29	0.43	0.97	0.88	2.27	8.79	16.09	14.83	12.20	11.70	4.33	0.76	0.18	74.99
RAJSHAHY	Pauchbilla	12-13	0.33	0.82	0.90	1.00	7.63	11.03	13.40	11.41	10.41	3.92	0.00	0.18	60.49
	Beaulah	30-34	0.29	0.89	1.23	1.73	5.59	10.31	11.49	10.74	10.83	4.77	0.27	0.06	55.44
	Natore	15-19	0.30	0.89	0.93	1.17	6.79	9.98	12.29	12.83	11.71	4.20	0.26	0.11	62.34
MALDAH	Nongon	6-7	0.77	0.41	1.27	0.63	5.36	13.36	10.53	9.03	12.68	2.20	0.17	0.17	66.66
	Malda	31-33	0.64	0.73	0.85	1.35	3.47	9.83	10.74	10.17	10.78	4.21	0.21	0.33	53.33
DINAPORE	Chanchal	11-13	0.31	0.66	0.40	1.01	4.90	11.03	13.37	13.73	10.25	3.03	0.34	0.07	60.08
	Mohadebpor	11-12	0.37	0.51	0.70	0.99	6.24	12.80	10.81	12.65	11.30	3.04	0.14	0.16	60.16
	Churamon	10-11	0.43	0.47	0.43	0.43	4.70	11.03	12.94	10.65	12.69	2.42	0.18	0.14	64.67
	Maurange	12-13	0.37	0.30	0.82	1.19	6.39	13.74	12.09	12.65	10.43	3.60	0.10	0.14	63.33
	Dinapore	29-31	0.24	0.37	0.79	2.27	7.93	16.84	13.21	13.21	13.02	4.72	0.22	0.10	74.34
RANGPORE	Baichorhat	8	0.02	0.29	0.38	0.93	5.39	13.47	10.08	9.13	10.92	3.40	0.11	0.22	61.61
	Bhawanigunge (Gyabanda)	19	0.34	0.91	1.46	2.73	9.11	16.09	11.91	10.29	11.47	4.53	0.11	0.16	60.51
	Rangpore	25-32	0.14	0.34	1.15	3.06	10.47	21.03	15.77	13.00	13.06	4.76	0.36	0.12	63.70
JULPIGOORE	Kaichar	13-14	0.51	0.31	1.03	4.79	13.56	24.01	13.37	10.86	11.71	4.18	0.26	0.19	60.70
	Bagdoga (Nilphamari)	12-14	0.30	0.32	1.18	3.13	11.87	25.33	13.58	13.17	14.83	3.89	0.08	0.19	60.87
COOCH BEHAR	Julpore	19-20	0.34	0.30	1.09	3.06	11.48	29.12	20.06	20.91	23.59	3.25	0.10	0.00	120.38
	Jinbatta	12-13	0.51	0.74	1.81	6.18	14.37	31.23	16.19	15.70	21.20	4.74	0.63	0.19	110.84
	Cooch Behar	17-18	0.43	0.29	1.93	6.40	14.57	26.53	23.35	24.03	21.44	4.21	0.11	0.10	129.65
	Masighunee	12-13	0.27	0.28	1.30	4.79	13.01	21.31	21.34	22.03	22.89	4.21	0.03	0.16	117.73
DARJELING HILL.	Metabhanee	12-13	0.24	0.29	2.29	4.54	11.98	32.23	21.16	22.35	22.74	0.24	0.08	0.12	126.33
	Muz	19-20	1.12	0.92	3.14	8.79	20.43	41.19	47.04	43.60	31.83	9.08	0.57	0.37	313.27
	Singur	8-1	0.91	0.27	1.71	3.18	8.88	25.40	27.61	21.83	14.93	4.11	0.32	0.09	109.78
NORTH BENGAL.	Darjeeling	28-31	0.89	1.14	2.78	3.93	7.57	24.02	30.36	26.47	17.42	6.10	0.23	0.21	130.11
	Kalimpong	8	1.29	0.73	1.13	2.99	5.91	18.73	21.61	20.41	10.38	4.09	0.26	0.36	90.34
PURNIA	Kisanganee	17-18	0.02	0.44	0.66	1.87	4.61	15.39	14.40	15.71	13.79	3.13	0.07	0.14	71.73
	Arravah	16-18	0.5	0.33	0.42	1.5	2.77	12.99	10.18	13.80	13.25	3.81	0.06	0.09	66.36
	Purneah	15-19	0.47	0.35	0.41	1.41	4.19	10.66	14.13	14.50	13.47	3.74	0.06	0.16	64.16
NORTH BENGAL.	Madadpore	18-19	0.47	0.36	0.69	1.03	4.31	8.33	12.01	11.80	10.29	4.32	0.08	0.08	63.21
	Soopul	17-18	0.47	0.49	0.60	0.88	3.98	8.97	11.34	11.88	9.40	2.72	0.03	0.13	60.00
DURGAPUR	Talpo	18	0.64	0.34	0.23	0.72	2.27	7.46	12.81	10.60	8.00	8.04	0.10	0.08	65.29
	Durbhanga	18	0.62	0.43	0.29	0.62	2.61	7.84	12.92	11.14	9.33	2.82	0.08	0.17	67.06
	Madhubani	17-18	0.74	0.41	0.37	1.06	3.03	8.4	10.34	10.47	9.90	2.65	0.08	0.07	67.33
MORUPPPORE	Shamari	18	0.53	0.30	0.85	1.18	2.61	7.81	10.47	9.52	9.23	2.61	0.01	0.13	65.56
	Morupore	30-31	0.59	0.0	0.48	0.67	2.36	6.81	10.94	10.25	8.23	2.87	0.08	0.08	63.89
	Hajipore	17-18	0.63	0.66	0.38	0.19	2.03	6.51	12.21	10.64	7.10	3.76	0.14	0.12	66.24
CHUMPARNEE	Mothari	29-31	0.47	0.24	0.51	0.64	2.44	8.25	10.96	12.23	9.52	3.56	0.09	0.11	61.36
	Bettiah	17-18	0.09	0.41	0.36	0.75	2.60	8.25	12.99	12.12	9.52	3.38	0.01	0.23	61.77
BARDE	Gopalgunge	10-12	0.44	0.33	0.14	0.22	2.68	6.65	15.51	10.16	7.30	4.50	0.13	0.18	65.73
	Kewan	14-19	0.78	0.48	0.23	0.27	1.80	6.06	11.08	10.80	8.83	3.41	0.11	0.14	63.65
SOUTH BENGAL.	Chuprab	33-36	0.71	0.43	0.38	0.36	1.44	6.17	10.85	9.35	7.21	2.93	0.21	0.09	66.15
BAGUR	Buxar	20-21	0.79	0.32	0.27	0.10	0.99	4.76	11.07	10.06	7.43	3.20	0.14	0.21	59.40
	Dehree	8-7	0.73	0.23	0.79	0.11	3.20	3.71	11.01	12.59	7.47	2.69	0.23	0.27	63.66
	Bhubanesh	18-19	0.69	0.29	0.26	0.14	1.12	5.06	12.37	12.00	6.70	3.11	0.30	0.31	61.94
GYA	Basurrah	18-19	0.56	0.44	0.39	0.17	1.12	5.40	11.98	12.81	6.92	3.49	0.34	0.29	61.55
	Arrah	30-33	0.53	0.54	0.40	0.50	1.53	6.45	12.02	10.35	8.38	2.94	0.21	0.16	64.00
	Aurangabad	17-19	0.81	0.71	0.39	0.23	1.03	5.21	12.39	12.96	7.13	2.61	0.28	0.30	64.16
PATNA	Gya	27-29	0.73	0.50	0.42	0.32	1.23	6.13	11.81	10.61	7.15	2.34	0.24	0.19	61.00
	Nowadah	18-19	0.70	0.46	0.47	0.30	1.91	5.36	11.77	11.45	6.94	2.30	0.18	0.22	62.29
	Jehanabad	16	0.72	0.60	0.35	0.15	1.68	4.91	12.23	12.90	6.72	3.33	0.27	0.16	63.31
PATNA	Patna	32-33	0.59	0.47	0.34	0.27	1.74	6.72	10.80	10.00	7.7	2.81	0.23	0.16	61.90
	Dinapore	18-19	0.59	0.30	0.18	0.23	1.45	6.40	11.71	11.50	6.61	3.06	0.14	0.18	60.50
	Behar	18-19	0.67	0.32	0.34	0.25	2.10	6.17	13.04	11.33	6.58	3.66	0.08	0.13	64.28
MORUPPPORE	Barh	18-19	0.67	0.34	0.12	0.22	2.32	4.86	12.73	9.00	7.68	3.03	0.26	0.13	63.37
	Seegowah	18-19	0.54	0.53	0.24	0.34	3.35	6.01	11.39	10.33	7.29	3.80	0.21	0.08	62.45
	Manahy	31-37	0.65	0.64	0.43	0.45	2.12	4.59	11.72	10.72	8.44	3.81	0.26	0.10	65.71
SOUTH BENGAL.	Jamui	17-19	0.71	0.60	0.43	0.50	2.11	6.35	12.90	13.14	7.29	2.84	0.09	0.09	65.16
	Bharulpore	31-35	0.50	0.64	0.30	0.91	2.67	8.14	11.50	10.80	7.91	3.08	0.23	0.00	67.79
SOUTH BENGAL.	Barka	18-19	0.59	0.50	0.24	0.50	2.57	7.30	10.42	11.55	8.03	3.43	0.13	0.16	64.78
	Rajmahal	17-19	0.19	0.46	0.33	1.01	4.93	10.02	12.91	10.43	11.66	3.03	0.23	0.00	65.38
	Godda	16-17	0.35	0.44	0.40	0.40	2.05	6.70	11.21	11.95	8.53	2.96	0.10	0.13	67.39
NORTH BENGAL.	Pakour	11-12	0.53	0.67	0.57	0.86	4.68	10.83	13.26	14.3	13.16	4.45	0.17	0.16	67.33
	Nya Doomba	18	0.55	0.68	0.72	1.00	3.43	8.79	13.40	11.07	10.27	3.86	0.23	0.23	67.39
	Deochur	19-20	0.43	0.43	0.85	0.80	3.01	8.15	13.04	12.57	8.51	4.34	0.15	0.16	67.39
CHUTTA NAG-PUR.	Jaunpur	13-15	0.62	0.50	0.77	0.61	2.39	7.90	13.24	13.24	7.03	3.08	0.30	0.14	61.70
	Pachamba (Girdi)	18-19	0.39	0.40	0.66	0.64	2.25	7.81	13.29	12.94	8.08	3.21	0.20	0.17	60.18
	Hazaribagh	27-29													

III.—Comparison Table of the Rainfall of 1889 at 169 Rainfall-recording Stations in Bengal with the Average of previous years.

DISTRICT.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
ORISSA.														
POORBH	Poorbh	-0.56	-0.93	-0.87	-0.80	-1.00	+4.75	+0.97	+10.21	-5.36	+4.96	+15.55	-0.52	+20.12
	Kumrah	-0.37	-0.62	-0.75	-0.54	-2.72	+5.73	+2.51	+2.72	-2.13	+5.35	+4.32	-0.50	+17.06
	Bangur	-0.40	-0.74	-0.72	-1.51	-0.86	+0.61	+0.88	+2.61	-4.02	+5.39	+11.07	-1.04	+12.78
	Faine Point	-0.29	+1.16	-1.16	-1.51	-2.51	+0.26	-2.67	+2.10	-5.04	+0.03	+14.20	+0.46	+10.88
CUTTACK	Jaratigumpha	-0.56	+1.92	-0.81	-0.72	-0.65	+1.25	+1.92	+0.61	-4.06	+5.33	+9.07	-0.29	+21.67
	Panki	-0.10	+0.10	-1.2	-0.33	-1.32	+1.82	+4.18	+3.60	-5.41	+5.84	+5.05	-0.71	+17.88
	Cuttack	-0.40	-0.23	-1.17	-0.34	+0.02	+0.10	+0.33	+2.95	-1.71	+3.39	+10.47	-0.44	+16.79
	Kendrapara	-0.46	+0.65	-0.68	-0.34	-1.12	+0.59	+4.81	+1.77	-3.08	+7.56	+9.30	-0.22	+17.00
BALASORE	Jajpore	-0.13	-0.46	-1.03	-1.23	+0.67	+3.03	-2.91	-3.05	-2.26	+1.11	+0.14	-0.71	-0.17
	Chandbali	-0.40	+0.78	-0.79	-0.22	-1.46	-2.27	-3.51	-1.78	-1.71	+2.21	+0.41	-0.40	-1.28
	Shudhrach	+0.11	-0.94	+0.21	-1.9	+0.19	-0.7	-0.47	+0.92	-2.57	+0.30	+7.24	-0.37	+1.90
	Sorah	-0.25	+0.76	-0.19	-0.56	+0.02	-2.18	-3.35	-3.03	-6.31	+1.70	+0.45	-0.15	-7.24
SOUTH-WEST BENGAL.	Balasore	-0.73	-0.55	-1.70	-1.40	-0.62	-0.51	-7.41	-1.27	-2.26	+5.76	+0.32	-0.26	-16.67
	Debasore	-0.72	+0.04	-0.91	-1.41	-2.14	+0.45	-11.51	-2.78	-5.45	+4.08	+8.80	-0.11	-16.85
	Baripodah	-0.28	+1.09	-1.12	+0.34	-0.61	+3.72	-2.52	+1.55	-3.70	+1.09	+0.28	-0.20	+0.32
MIDNAPORE	Contai	-0.31	+0.49	-1.01	-1.51	-2.05	+1.18	-0.70	-1.04	-2.34	-2.27	+0.69	-0.20	-11.98
	Saugor Island	-0.31	+0.34	-1.5	-1.31	-2.34	+1.12	-0.86	-2.51	-7.60	+1.85	+5.70	-0.26	-13.96
	Tumlook	-0.38	+1.24	-1.77	-0.94	-3.11	+2.38	-3.0	-2.08	-3.25	+2.91	+1.11	-4.26	-2.91
	Midnapore	+0.95	+4.76	-1.41	-0.21	-2.09	-0.33	-0.9	+0.54	-1.00	-2.09	+3.05	-0.28	-4.80
24-PARGANAS.	Chattal	-0.05	+0.38	-1.10	-0.10	-1.10	1.02	-0.35	-4.04	-3.41	+0.97	+1.95	-0.27	-12.75
	Garbeta	-0.7	+0.17	-1.40	-2.05	-0.86	+0.35	-1.24	-4.25	-2.62	-1.70	+1.92	-0.19	-8.75
	Diamond Harbour	-0.61	+0.11	-1.61	-1.05	+0.09	+0.75	-4.38	-1.34	-0.60	+0.99	+5.00	-0.27	-0.16
	Alipore Jail	-0.44	+1.13	-1.35	+0.61	-1.5	+0.11	-0.30	-0.7	-4.57	+0.28	+7.27	-0.37	-5.02
HOWRAH	Barackpore	0.3	+0.25	-1.61	-0.66	-0.65	+4.5	-2.0	-4.22	+2.00	+3.61	+2.05	-0.30	-1.06
	Dum-Dum	-0.08	+1.26	-0.61	-1.37	-2.40	+0.7	-3.2	+0.33	-0.7	+3.56	+5.00	-0.0	+9.13
	Howrah	-0.37	+1.44	-1.21	-1.63	-3.7	+0.07	+0.61	-2.61	-3.15	+4.27	+4.00	-0.29	+2.00
	Howrah	-0.15	+0.42	-1.09	-1.51	-1.5	+3.00	0.11	-4.24	-0.60	+0.31	+2.78	-0.22	+1.12
HOOGHLY	Saunapore	-0.16	+0.41	-1.07	-1.11	-2.97	+1.21	-2.70	-2.81	-0.12	+4.65	+2.34	-0.27	-0.13
	Hooghly	-0.27	-0.38	-1.75	-1.01	-3.82	+1.1	-0.70	-0.80	-1.34	+2.21	+0.26	-0.26	-19.40
	Jatrabadi	+0.29	-0.09	-0.9	-0.37	-3.84	+0.42	-0.91	-0.81	-5.00	-2.63	+2.00	-0.16	-17.61
BURDWAN	Culina	+0.22	0.7	-1.08	1.3	-2.00	-0.3	-5.3	-0.10	+1.61	-1.63	+5.10	-0.21	-9.00
	Burdwan	+0.05	-0.41	-1.4	-0.87	-2.00	+2.37	-0.6	-0.80	+1.27	-2.86	+4.46	-0.17	-7.40
	Culina	+0.15	-0.66	-0.80	1.46	-5.4	-2.3	-3.1	-4.88	-2.10	-1.31	+0.11	-0.10	-10.02
BANKURA	Bankura	+0.18	-0.08	-0.84	0.17	+0.35	+4.7	-2.3	-3.70	-1.97	-1.40	+3.73	-0.17	-2.17
	Bishnupore	+0.33	+0.41	+0.1	-0.22	-1.62	+5.01	+0.9	-7.37	+0.5	+3.00	+5.17	-0.24	+3.91
	Khatra	+0.30	+0.41	+0.1	-0.22	-0.58	+5.02	+0.9	-7.37	+0.5	+3.00	+5.17	-0.24	+3.91
	Khatra	-0.49	+1.0	-1.14	+0.65	-1.11	+0.3	-1.4	-1.01	-0.27	-1.61	+2.70	-0.42	+0.63
BIRBHUM	Kampur	-0.37	-0.12	-0.72	+0.01	2.38	+8.46	+2.88	-7.26	-3.82	+2.11	+3.20	-0.20	+2.65
	Bh. B. av	+0.06	+0.18	-0.1	0.91	+0.6	+2.9	-1.03	-1.25	+2.4	-0.56	+3.78	-0.10	+5.95
	Baranpore	+0.85	-0.1	0.04	+0.02	+0.02	+2.2	-0.58	-1.27	-2.64	-1.00	+4.56	-0.12	+8.25
	Kampur-Haut	+1.95	+0.12	+0.88	-1.4	-0.52	+1.8	-0.9	-0.90	+1.28	-3.65	+2.20	-0.18	+3.30
NEDDA	Haragunge	+1.10	-0.18	-0.11	-1.1	+1.93	+4.40	-1.13	-3.70	-0.11	-2.73	+7.12	-0.12	+4.60
	Ranaghat	+1.20	-0.40	-0.3	-2.07	-2.91	+4.08	-1.74	-0.97	+4.01	+0.11	+3.50	-0.25	+4.08
	Kishanpur	+0.65	-0.31	-0.81	-1.80	-4.0	-0.16	-1.7	-0.71	-2.23	+0.30	+8.44	-0.17	-10.17
	Chandamara	+0.61	-0.31	-0.9	-2.08	-3.80	-0.0	-1.88	-5.45	+0.6	-0.63	+10.15	-0.15	-0.67
KOOBIA	Meherpore	+1.84	-0.15	+0.75	+4.10	-2.17	+1.99	-2.15	-3.58	+2.35	+5.70	-0.18	+1.13	+1.13
	Koochies	+0.19	-0.38	-1.5	-2.1	-4.25	+3.51	-0.91	-2.82	+0.88	-2.82	+3.00	-0.19	-2.67
KHOOLIA	Rathia	+0.06	0	-1.01	-2.10	-4.07	-0.77	-2.0	-3.07	-2.13	+4.50	+3.20	-0.33	-7.40
	Bachhat	-0.60	-0.33	-1.25	-0.70	-2.81	+1.32	-4.00	-4.67	+5.43	+2.30	+0.04	-0.10	-10.78
	Khoolia	-0.3	-0.77	-1.00	-0.48	-3.80	1.26	-3.41	-2.98	+1.33	+7.32	+3.21	-0.14	-4.97
JESSORE	Kandi	+0.85	-0.16	-1.11	0.50	-3.37	+0.3	+0.10	-2.15	-1.81	+4.05	+4.60	-0.23	-0.20
	Jessore	-0.02	-0.5	-1.23	-1.82	-3.35	+5.62	-2.0	-4.50	+0.43	+2.62	+6.78	-0.19	-0.86
	Jumrah	+0.31	-0.6	-2.14	-0.70	-3.40	-2.12	-2.82	-0.60	+0.08	-0.08	+4.60	-0.17	-5.79
	Mangera	+0.34	-0.67	-1.08	-1.05	-3.09	+4.1	-0.71	-1.11	-0.53	+3.66	+0.44	-0.16	-2.17
MOONSHEDA-BA.	Bongong	+0.12	-0.20	-1.22	-1.92	-4.41	+0.09	-0.02	-7.31	-3.87	+5.21	+3.61	-0.36	-10.75
	Kandi	+0.34	+0.04	-0.15	-1.00	+0.42	+0.56	-3.05	-3.84	+0.88	-3.10	+5.78	-0.25	+2.70
	Baranpore	+0.94	-0.05	-0.88	-1.02	+2.47	+0.64	-3.04	-4.24	-0.30	-3.80	+3.01	-0.19	-6.62
	Lalbagh	+1.28	+0.01	-0.70	-1.10	+0.8	-3.02	+1.64	-0.58	-0.66	-1.63	+4.25	-0.10	-6.13
EAST BENGAL.	Asimgunge	+1.00	+0.06	-0.95	+0.1	-0.15	-0.0	-0.21	-0.80	+5.18	-4.32	?	-0.16	-6.52
	Jumrah	+1.51	+0.29	-0.20	+0.27	-1.55	+4.38	+2.35	-5.64	+4.76	-1.30	+2.65	-0.14	+7.41
	Lalgola	+1.73	+0.40	-0.80	-0.71	-0.71	+0.27	+2.08	-5.84	+6.26	-1.93	+1.58	-0.14	+0.78
CHITTAGONG	Cox's Bazar	-0.77	+0.01	-1.26	-2.53	-4.30	-7.78	-12.18	+9.13	+0.12	-0.41	-1.43	-0.23	-14.29
	Chittagong	-0.81	-0.79	-1.36	-1.15	-4.29	-4.10	-10.00	+3.91	-0.14	-2.19	+0.07	+0.14	-21.17
CHITTAGONG HILL TRACTS.	Rangamati	-0.56	+0.40	-2.72	+0.07	-3.80	-4.20	-2.64	-0.49	-4.10	-5.25	+2.67	-0.13	-21.64
	Ruma	-0.68	+0.41	-1.08	-3.30	-3.35	-5.02	-2.48	-1.74	-1.62	-0.00	+2.09	+0.30	-16.76
BACHENGAUNG	Patakhally	-0.77	+1.54	-1.40	-1.82	-2.0	-0.53	-1.30	+1.00	-2.90	+1.99	+0.23	-0.40	-0.77
	Perorepore	-0.44	-0.60	-1.34	+0.43	-4.43	+5.25	-3.37	-3.00	-6.81	+1.50	+0.00	-0.07	-2.14
	Portul	-0.09	+0.40	-1.00	-1.85	-4.75	+3.77	-4.57	-2.82	-2.00	+4.20	+1.15	+0.10	-2.00
	Rhola	-0.35	-0.08	-0.99	-2.01	-2.08	-0.70	-5.83	-2.12	+0.10	+1.40	+5.38	-0.20	-8.56
KOKKHOLLY	Kokkholly	-0.64	+0.68	+0.27	-3.25	-3.37	+1.74	-0.74	-0.00	+1.95	-0.87	+1.70	-0.25	-2.70
	Kenny	-0.79	+0.28	-0.54	+0.30	-5.25	-10.08	+4.10	-10.45	-6.06	-3.20	-0.54	-0.44	-3.87
FCHSHEDPORE	Madhripore	-0.21	-0.31	-2.57	-1.98	-5.58	+4.67	-3.07	-1.43	-2.10	+5.88	+3.45	-0.67	-5.38
	Furrodpore	+0.26	-0.67	-2.42	0.70	-5.51	+0.55	+0.12	-0.34	-0.10	-0.23	+0.78	-0.12	+0.94
	Goolundo	+0.87	-1.00	-2.14	-0.33	+0.09	+6.29	-2.40	-2.20	-3.00	-0.82	+7.51	-0.13	+2.21

DISTRICT.	STATION.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	TOTAL.
EAST BENGAL														
—concluded.														
MYMENSINGH	Kishoreganj	+0.15	-0.05	-3.01	+2.86	-3.92	+2.30	+0.26	-0.53	+0.33	-0.30	+1.08	-0.30	-1.04
	Atia	+0.05	-0.04	-1.45	-2.95	+0.07	+4.03	+0.00	-0.37	-2.27	-2.11	+1.07	-0.07	+0.23
	Mymensingh	+0.42	-0.08	-2.14	-0.05	-4.08	+4.32	+4.32	+4.19	+1.22	+2.74	+1.49	-0.13	+1.86
	Jawalpara	+1.41	-0.05	-1.46	-2.31	-4.29	+12.24	+1.03	-1.71	+4.04	+0.81	+0.73	-0.31	+15.63
NORTH BENGAL	Netrokona	+0.10	-0.06	-2.29	+4.11	-1.79	+16.84	+12.07	+5.21	+2.14	+5.09	+2.04	-0.15	+63.86
	Pubna	+0.14	-0.49	-1.77	-0.85	-3.17	+8.75	-3.51	-0.61	-1.23	-2.74	+0.07	-0.07	-7.40
PURNA	Sorajganj	+1.07	-0.31	-1.31	-1.54	+0.41	-2.40	+0.05	-1.29	-2.02	+3.01	+2.37	-0.01	+3.21
ROURA	Rhorow	+1.01	-0.10	-1.45	-0.05	3.70	+6.41	-1.85	+2.73	+1.73	-0.35	+0.85	-0.22	+3.94
	N. Chilla	+1.08	+0.39	-1.16	-0.05	-3.02	+8.47	-0.74	-2.46	+7.84	-3.02	+0.35	-0.16	+4.32
	B. Ch.	+1.39	-0.53	-0.88	-3.27	-7.64	+9.07	-0.43	-0.01	+7.50	-3.19	+0.44	-0.03	-1.44
	Panchgabi	+2.01	+0.03	-0.30	-1.00	-0.70	+17.00	-0.43	-6.43	+7.93	+0.04	+0.14	-0.18	+8.20
RAJSHAHYE	Beaulah	+1.40	+0.12	-1.17	-1.57	-3.31	+4.74	-2.10	-0.65	+0.80	-2.70	+2.17	-0.08	-0.16
	Natore	+2.10	-0.54	-0.03	-0.89	-6.25	+1.73	+4.26	-0.12	-1.81	-2.20	+2.08	-0.11	+1.17
	Naogon	+2.04	+1.18	-1.27	0.00	-4.91	+5.04	-0.52	-2.16	+4.82	-0.86	+0.72	-0.17	+3.63
MALDAH	Maldah	+3.55	-0.18	-0.45	-1.35	-2.69	+1.08	-2.40	-4.56	+8.03	-0.40	+0.62	-0.23	+0.07
	Chanchal	+1.03	+0.03	-0.42	-1.01	-4.07	-0.61	-3.21	-11.43	+1.73	-2.75	-0.10	-0.07	-20.80
DINAPORE	Mahadipur	+2.71	-0.05	-0.00	-0.00	-5.59	+8.61	-2.00	-5.55	+2.79	-0.36	+0.61	-3.10	-3.73
	Churamon	+2.47	+1.23	-0.11	-0.03	-4.40	-0.78	+1.84	-3.02	+3.02	-2.26	+0.23	-0.14	+0.08
	Rangpur	+2.47	+0.51	-0.00	-1.17	-0.23	-0.15	-1.27	-1.05	+4.01	-2.20	-0.10	-0.11	+5.00
	Dinapore	+2.14	0.00	-0.70	-2.27	-0.83	+6.80	-1.17	-1.61	+5.01	-4.30	-0.21	-1.10	-3.71
	Balorghat	+2.43	+0.22	-0.38	-0.18	-4.27	+6.72	-1.00	-2.20	+9.00	+0.88	+0.15	-0.21	+10.14
RANGPUR	Bhawaniganj (Gyabanda)	+2.45	0.00	-1.44	-0.74	-4.00	+1.17	+1.07	+1.25	+7.08	-3.12	+0.07	-0.00	+24.15
	Rangpur	+2.34	-0.35	0.00	0.00	-5.86	+0.76	+0.76	-1.11	+1.24	-3.10	-0.10	-0.11	+2.31
	Kurigram	+1.83	-0.30	1.00	-1.11	7.88	+12.24	+3.41	-1.15	+10.07	-3.18	-0.12	-0.23	+11.80
	Bagdara (Niphamari)	+1.78	+0.74	-1.16	+0.21	-0.04	+3.02	+8.80	+4.28	-0.80	-3.13	-0.03	-0.19	+4.23
JALPAIGUR	Jalpaiguri	+1.92	+0.58	-1.80	-2.83	-4.02	+4.00	+12.32	-2.74	-3.47	-3.39	-0.03	-0.08	+0.01
COOCH BEHAR	Dumtala	+1.62	-0.76	-1.55	-2.04	-5.36	-2.28	+4.02	-1.41	+3.74	-2.82	+0.08	-0.10	-4.43
	Cooch Behar	+2.10	+0.50	-1.78	-3.21	-3.07	8.61	+1.12	+8.60	-0.27	-2.70	+0.20	-0.10	+0.79
	Matachana	+1.01	-2.19	-1.25	-2.82	-0.01	+9.33	+1.18	+8.85	-0.30	-2.87	+0.50	-0.10	+10.25
		+1.48	-1.00	-1.18	-0.03	-2.03	-7.05	-2.67	-0.45	-11.20	-3.01	+0.16	-0.12	+2.37
DARJEELING	Rita	+1.12	+1.78	+3.00	-0.80	-3.25	-0.48	+2.44	-4.20	-0.73	-3.07	+0.21	-0.40	-1.02
	Silchar	+1.10	+0.73	+0.37	-0.01	-4.14	+5.01	+0.00	-0.17	+0.11	-1.14	+0.05	-0.02	+10.57
	Darjeeling	+2.10	+1.51	+1.00	-0.45	-2.28	-7.33	-2.25	-0.80	-3.51	-3.51	-0.07	-0.21	+8.33
	Kampong	+4.03	+0.00	+0.02	-0.11	-1.26	+7.71	+10.36	-5.41	-0.34	-0.99	+0.01	-0.26	+11.77
NORTH BEHAR														
PERSEAN	Kishoreganj	+1.30	-0.24	-0.00	-1.40	-3.24	+0.02	+13.72	-3.80	+1.71	-2.84	-0.07	-0.14	+20.20
	Actaresh	-1.05	-0.17	-0.02	-1.50	-4.51	+1.08	+3.45	+1.40	+3.00	-3.43	-0.08	-0.09	+13.30
NORTH BHAR	Purnea	+2.11	-0.15	-0.40	-1.50	-1.01	-0.35	-5.44	-0.20	+0.41	2.25	-0.04	-0.15	+3.23
NORTH BHAR	Maddur	+3.70	+0.02	-0.30	-1.01	-2.60	+0.04	+5.23	-3.27	+7.15	-1.87	-0.00	-0.00	+12.50
	Soopool	+2.50	+0.02	-0.30	-1.01	-2.60	+0.04	+5.23	-3.27	+7.15	-1.87	-0.00	-0.00	+12.50
DURGAM	Tajpur	+2.14	-1.37	-0.16	-0.02	-0.80	+4.30	2.27	-2.33	+2.09	-2.68	-0.07	-0.08	+3.11
	Burhinma	+2.71	-0.24	-0.10	-0.50	-2.41	+1.01	+2.35	+1.07	+1.87	-0.28	-0.00	-0.17	+0.08
	Madubani	+0.99	+0.40	-0.37	-1.06	-0.4	+5.0	+4.73	+2.19	+5.04	-2.48	-0.03	-0.07	+18.36
MOSUPPUR	Sitamarhi	+3.40	+0.54	-0.02	-1.14	-2.72	+3.88	+2.00	+2.00	+1.47	-2.46	+0.20	-0.12	+14.30
	Mosuppur	+2.55	+1.04	-0.31	-0.02	-1.01	+0.00	+0.00	+4.80	+2.00	-2.27	+0.04	-0.00	+0.07
	Ilajpur	+1.27	+1.44	-0.26	-0.18	-0.82	+3.88	-3.00	-0.14	+3.00	-3.76	+0.00	-0.12	+2.23
CHUMPAR	Matbari	+2.11	+0.80	-0.47	-0.04	-1.02	+1.54	+1.50	-4.73	+0.47	-3.14	+0.51	-0.15	+30.42
	Betnah	+1.12	+1.01	-0.24	-0.72	-1.03	+0.41	+0.00	-5.73	+4.03	-3.08	+0.73	-0.23	+4.88
SANGS	Gopalganj	+2.43	+1.22	+0.10	-0.02	-0.65	+0.12	-2.80	-0.32	+4.75	-4.59	+0.23	-0.16	-4.01
	Sawan	+1.95	+0.53	+0.02	-0.27	-0.00	+0.00	-0.40	-1.26	-0.40	-3.41	+1.44	-0.14	+2.41
	Chuprah	+1.98	+0.79	-0.04	-0.35	-1.17	+1.19	+3.03	-1.77	+2.63	-2.03	+1.04	-0.00	+4.15
SOUTH BEHAR														
SHAHAD	Buxar	+0.54	+0.80	-0.23	-0.16	-0.78	+5.05	+5.05	+1.04	-1.48	-2.18	+2.30	-0.21	+10.03
	Dohar	-0.24	+0.78	+0.45	-0.11	-0.75	+2.50	+1.79	+0.02	-0.07	-0.55	+0.12	-0.57	+1.65
	Bhuthan	-0.18	-0.31	+0.10	-0.14	-0.02	-3.16	-1.82	+4.05	+0.15	-2.00	+1.01	-0.38	+2.97
	Sasaram	0	+0.14	+0.02	-0.17	-0.01	-1.00	-0.25	+3.01	-3.00	-2.45	+0.20	-0.35	-10.50
GYA	Arrau	+0.61	+0.54	-0.31	-0.59	-0.03	+1.03	+0.00	+3.45	-3.20	-2.02	-0.03	-0.14	+0.01
	Aurangabad	+0.04	+0.55	-0.11	-0.00	-0.70	-1.22	-3.17	+4.05	-3.69	-2.23	+0.11	-0.04	-0.77
	Gya	-0.01	+2.63	+0.09	-0.32	-1.25	+2.92	+1.08	+0.01	-1.00	-1.24	-0.11	-0.19	+2.81
	Nowada	+1.42	+0.40	-0.12	-0.30	-2.77	+0.13	-1.00	-0.67	-1.00	-1.34	-0.13	-0.24	+0.43
PATNA	Jehanabad	+1.18	+1.28	-0.10	-0.15	-2.68	+0.36	-5.19	-0.22	-1.22	-2.38	+0.13	-0.14	-5.35
	Patna	+1.43	+1.05	-0.09	-0.27	+1.15	+7.57	-1.76	-0.51	+7.83	-2.76	0	-0.00	+13.44
	Dinapore	+1.41	+0.91	+0.16	-0.25	-0.01	+3.01	+1.90	-1.28	+3.78	-2.96	+0.11	-0.08	+6.67
	Behar	+1.22	+0.16	-0.04	-0.23	-0.08	+5.40	-2.50	+0.07	-0.00	-2.70	-0.00	-0.13	+1.37
MONGHYR	Barh	+2.06	+2.33	-0.14	-0.12	+0.64	+5.41	-0.52	-3.73	-3.00	-4.02	-0.15	-0.14	-0.00
	Beegowal	+2.58	+1.23	-0.01	-0.30	+0.10	-0.20	+3.84	-3.52	+0.38	-2.55	-0.21	-0.08	+1.01
	Monghyr	+1.98	+0.74	-0.33	-0.45	-1.38	+3.45	-3.65	+0.36	+3.10	3.81	-0.20	-0.00	+0.74
	Jamui	+1.77	+0.54	-0.20	-0.20	-0.12	+4.44	-1.72	-0.35	+1.80	-2.33	+0.12	-0.04	+1.00
SOUTH BHAR	Shahpur	+1.53	+1.04	-0.30	-0.44	-1.06	+3.40	-0.50	-2.80	+2.03	-3.93	-0.18	-0.00	+1.00
	Banka	+2.75	+0.20	-0.34	-0.24	-1.00	+2.85	-0.41	-0.11	+2.61	-1.97	+0.11	-0.14	-3.31
NORTHAL PER	Rajmahal	+2.10	+0.36	-0.31	-1.04	-0.28	+4.01	-0.30	+2.03	+5.16	-1.31	+0.07	-0.00	+7.37
	Gidda	+2.50	+0.44	-0.40	-0.49	-1.25	+0.66	-2.91	-2.70	+2.34	-0.80	+0.03	-0.13	+5.04
	Pakur	+2.29	+0.11	-0.53	+0.03	-2.43	+1.05	+7.50	-3.00	+6.08	+0.00	+0.74	-0.14	+10.04
	Nya Bhojka	+1.47	+0.40	-0.51	-0.40	+0.00	+2.72	+4.40	-0.51	-1.05	+0.41	+2.80	-0.21	+8.10
	Dumhar	+1.00	-0.18	-0.51	-0.80	-2.41	-0.45	-2.79	-4.15	+1.80	-1.80	+1.44	-0.00	-10.35
CHUTIA	Jamtara	+0.07	+0.01	-0.22	-0.27	-2.41	+1.43	-2.45	-4.48	+2.23	-0.70			

Results of the Meteorological Observations taken at the Alipore Observatory from
9th to 15th February 1890.

Month.	Date.	Maximum in sun.	Number of hours of bright sunshine.	Mean pressure barometer at 32° Fahr.	TEMPERATURE.				HYGROMETRY.				WIND.		Rain.	WEATHER.
					Mean.	Maximum.	Range.	Minimum.	Mean wet bulb.	Vapour tension.	Dew point.	Humidity.	Prevailing direction.	Miles recorded.		
1890.		°		Inches.	°	°	°	°	°	Inches.	°	%			Inches.	
Feb.	9th	130.2	9.5	30.039	68.0	82.5	20.2	56.2	55.9	0.410	53.4	63	NNE, N and calm.	47	Nil	Clear,  .
"	10th	134.5	8.4	30.040	67.9	81.7	25.4	56.3	60.1	0.417	53.9	65	SSE, NNW and variable.	47	"	Chiefly clear,  .
"	11th	137.6	9.6	30.052	68.8	81.3	27.0	54.3	57.7	0.360	49.8	59	SE, NE by N and NNW.	66	"	Clear,  .
"	12th	134.2	9.2	30.009	65.5	81.1	30.4	50.7	57.4	0.307	50.4	62	NNW and W.	42	"	Clear,  .
"	13th	136.5	8.6	30.063	68.1	82.6	27.9	54.7	60.0	0.415	53.8	64	S by W and WSW.	59	"	Chiefly Clear  .
"	14th	140.0	9.0	30.083	70.0	84.2	25.7	58.5	65.4	0.532	60.7	74	SSW and WSW.	96	"	Partially cloudy,  .
"	15th	134.8	7.2	30.020	72.3	82.2	18.1	64.1	68.3	0.614	66.2	82	SSW, SW by S and Variable.	66	"	Partially cloudy,  .

The mean pressure of the seven days ... 29.975

The average pressure of the corresponding period for 24 years, S.-G.'s Office ... 29.951

The total number of hours of bright sunshine ... 61.5

The maximum possible number of hours of sunshine ... 79.1

The mean temperature of the seven days ... 68.5

The average temperature of the corresponding period for 24 years, S.-G.'s Office ... 72.2

The extreme variation of temperature ... 33.5

The maximum temperature ... 84.2

The highest velocity of the wind in one hour ... 9

The highest pressure of wind on one square foot ... Not measurable.

The mean relative humidity ... 67

The average relative humidity of the corresponding period for 24 years, S.-G.'s Office ... 69

The total fall of rain from 9th to 15th February 1890 ... Nil

The average fall of the corresponding period for 24 years, S.-G.'s Office ... 0.39

The total fall from 1st January to 15th February 1890 ... 0.77

The average fall of the corresponding period for 24 years, S.-G.'s Office ... 1.04

The mean pressure, temperature, &c., are deduced from the traces of the Barograph and Thermograph. The maximum and minimum temperatures are obtained from self-registering thermometers. All the thermometers are verified, and the readings have been corrected to a standard constructed and verified at the Kew Observatory. They are exposed under a thatched shed open at the sides, and are suspended four feet above the ground.

The barometer readings are corrected approximately to those of the standard, Newman's No 86, formerly at the Surveyor-General's Office.

The hygrometric elements are obtained from Tables III, IV, and V of the official tables computed in the Meteorological Office, and based on Regnault's modifications of August's formula.

The directions and the movement of the wind are taken from the trace of a Beckley's anemograph.

The mouth of the rain-gauge is one foot above the ground.

☁ dew, — fog.

C. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, GOVT. OF INDIA;

Calcutta, the 17th February 1890.

STATION OBSERVATIONS.

* Means of six days.

for the week ending Friday, the 14th of February 1890.

DISTRICT OBSERVATIONS.														Representative station.	District.	METEOROLOGICAL DIVISION.		
Average temperature at 5 A.M.	Average cloud amount at 5 A.M. for week.	Rainfall of week at observing station.	OF WEEK.		RAINFALL.								Average number of rainy days.					
			Mean for district.	Normal mean.	Since 1st of month.			Since 15th May 1889.			Mean for district.	Normal mean.	Variation.				Average number of rainy days.	Normal number of rainy days.
					Mean for district.	Normal mean.	Variation.	Mean for district.	Normal mean.	Variation.								
60	2.6	Nil	Nil	1.23	Nil	0.36	-0.38	74.94	80.01	+15.93	0.0	0.7	Poorer	Poorer	ORISSA.			
70	2.7	Nil	Nil	0.22	Nil	0.43	-0.43	60.39	62.41	+13.98	0.0	0.7	Cuttack	Cuttack				
80	2.4	Nil	Nil	0.20	Nil	0.39	-0.39	49.96	53.90	-3.94	0.0	0.7	Balasore	Balasore				
90	0	Nil	Nil	0.26	Nil	0.39	-0.39	49.96	53.90	-3.94	0.0	0.7	Balasore	Balasore	SOUTH-WEST BENGAL.			
100	1.4	Nil	Nil	0.35	Nil	0.92	-0.92	68.37	68.39	-0.02	0.0	0.6	Saugor Island	South-West Midnapore				
110	0.7	Nil	Nil	0.17	Nil	0.60	-0.60	40.39	52.17	-11.78	0.0	0.5	Midnapore	Midnapore				
120	1.3	Nil	Nil	0.29	Nil	0.80	-0.80	54.10	52.40	+1.70	0.0	0.8	Calcutta	24-Pergunnahs	SOUTH-WEST BENGAL.			
130	0.7	Nil	Nil	0.25	Nil	0.67	-0.67	43.80	47.38	-3.58	0.0	0.6	Burdwan	Burdwan				
140	1.1	Nil	Nil	0.30	Nil	0.42	-0.42	55.91	52.70	+3.21	0.0	0.6	Bankura	Bankura				
150	0.6	Nil	Nil	0.33	Nil	0.63	-0.63	52.40	53.25	-0.85	0.0	0.5	Raneegunge	Barbhoom	SOUTH-WEST BENGAL.			
160	1.1	Nil	Nil	0.20	Nil	0.46	-0.46	51.17	51.03	+0.14	0.0	0.5	Berhampore	West Burdwan				
170	0.6	Nil	Nil	0.24	Nil	0.61	-0.61	51.61	49.74	+1.87	0.0	0.5	Krishnagore	Moorsabadabad				
180	1.4	Nil	Nil	0.26	Nil	0.65	-0.65	54.78	53.87	+0.91	0.0	0.5	Jessore	Nuddea	SOUTH-WEST BENGAL.			
190	0.0	Nil	Nil	0.29	Nil	0.41	-0.41	109.35	114.19	-4.84	0.0	0.5	Chittagong	Chittagong				
200	0.7	Nil	Nil	0.29	Nil	0.44	-0.44	65.17	62.98	+2.19	0.0	0.7	Demaziri	Chittagong Hill Tract				
210	0.7	Nil	Nil	0.32	Nil	0.61	-0.61	78.41	77.63	+0.78	0.0	0.7	Barisal	Backergunge	SOUTH-WEST BENGAL.			
220	0	Nil	Nil	0.34	Nil	0.61	-0.61	90.82	107.75	-16.93	0.0	0.7	Naokholly	Naokholly				
230	0.4	Nil	Nil	0.24	Nil	0.61	-0.61	61.22	60.33	+0.89	0.0	0.6	Furzedpore	Furzedpore				
240	1.1	Nil	Nil	0.34	Nil	0.69	-0.69	76.19	60.29	+15.90	0.0	0.7	Dacca	Dacca	SOUTH-WEST BENGAL.			
250	0.4	Nil	Nil	0.42	Nil	0.63	-0.63	54.02	69.96	-15.94	0.0	0.6	Comilla	Tipperah				
260	0.6	Nil	Nil	0.37	Nil	0.63	-0.63	53.78	67.94	-14.16	0.0	0.7	Mymensingh	Mymensingh				
270	0	Nil	Nil	0.28	Nil	0.47	-0.47	65.62	67.70	-2.08	0.0	0.6	Bogra	Bogra	SOUTH-WEST BENGAL.			
280	0.1	Nil	Nil	0.22	Nil	0.62	-0.62	55.37	65.97	-10.60	0.0	0.6	Serajgonj	Pubna				
290	0.1	Nil	Nil	0.21	Nil	0.44	-0.44	54.30	64.32	-10.02	0.0	0.4	Rampore	Rajshahye				
300	0	Nil	Nil	0.17	Nil	0.45	-0.45	59.76	54.57	+5.19	0.0	0.5	Maldah	Maldah	SOUTH-WEST BENGAL.			
310	0	Nil	Nil	0.21	Nil	0.27	-0.27	57.19	57.07	+0.12	0.0	0.6	Dinapore	Dinapore				
320	0	Nil	Nil	0.20	Nil	0.60	-0.60	85.87	74.09	+11.78	0.0	0.6	Rangpore	Rangpore				
330	0	Nil	Nil	0.16	Nil	0.19	-0.19	117.73	111.44	+6.29	0.0	0.5	Jalpaiguri	Jalpaiguri	SOUTH-WEST BENGAL.			
340	4.9	0.01	Nil	0.19	Nil	0.31	-0.31	131.46	121.65	+9.81	0.0	0.8	Darjeeling	Darjeeling Hill Tract				
350	0	Nil	Nil	0.25	Nil	0.37	-0.37	75.00	89.96	-14.96	0.0	0.6	Purnea	Purnea				
360	0	Nil	Nil	0.16	Nil	0.29	-0.29	48.83	43.83	+5.00	0.0	0.6	Muzaffarpore	North Bhagulpore	SOUTH-WEST BENGAL.			
370	0	Nil	Nil	0.20	Nil	0.31	-0.31	52.11	45.13	+6.98	0.0	0.6	Dumkura	Muzaffarpore				
380	0.6	Nil	Nil	0.16	Nil	0.29	-0.29	63.96	67.08	-3.12	0.0	0.5	Mohani	Dumkura				
390	0	Nil	Nil	0.18	Nil	0.24	-0.24	40.13	43.22	-3.09	0.0	0.5	Gopura	Chumpanan	SOUTH-WEST BENGAL.			
400	0	Nil	Nil	0.15	Nil	0.27	-0.27	46.07	46.35	-0.28	0.0	0.5	Dumra	Saran				
410	0	Nil	Nil	0.10	Nil	0.28	-0.28	37.07	41.00	-3.93	0.0	0.4	Gya	Gya				
420	0	Nil	Nil	0.15	Nil	0.34	-0.34	63.49	41.00	+22.49	0.0	0.5	Bankipore	Patna	SOUTH-WEST BENGAL.			
430	0	Nil	Nil	0.12	Nil	0.30	-0.30	45.43	45.67	-0.24	0.0	0.4	Bankipore	Bankipore				
440	0	Nil	Nil	0.11	Nil	0.33	-0.33	54.15	61.15	-7.00	0.0	0.4	Bankipore	Bankipore				
450	0	Nil	Nil	0.23	Nil	0.37	-0.37	43.65	50.65	-7.00	0.0	0.6	Hazratnagar	Bankipore	SOUTH-WEST BENGAL.			
460	0.3	Nil	Nil	0.23	Nil	0.40	-0.40	44.36	49.36	-5.00	0.0	0.6	Bankipore	Bankipore				
470	1.4	Nil	Nil	0.21	Nil	0.28	-0.28	48.76	52.16	-3.40	0.0	0.7	Bankipore	Bankipore				

On 1000. The variations are *negatives* when the mean for the week is less than the corresponding normal mean, and *positives* when greater.
 The average cloud amount represents the part of the sky covered, the whole sky being denoted by 10. Under the head District observations of rainfall the normal means for 17 years. The means of the district are the numerical average of the rainfall returns received in the district, i.e., from total rainfall at the subdivisions.

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 14th of February 1890.

Meteorological division.	District.	Station.	RAINFALL.							TOTAL		Total rainfall since 1st of month.	Average total rainfall from 1st of month.	Total rainfall since 14th May 1889.	Average rainfall from 14th May to date.
			Saturday, 8th February.	Sunday, 9th February.	Monday, 10th February.	Tuesday, 11th February.	Wednesday, 12th February.	Thursday, 13th February.	Friday, 14th February.	Number of rainy days.	of rainfall week.				
UNIONA	Purba	Purba	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.47	50.71	51.73	
		Chandab	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	76.57	56.85	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.38	65.50	49.42	
		Laise Point	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.39	77.00	61.24	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	?	
	Cuttack	Jagatsingpur	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.25	74.60	47.71	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	57.18	49.84	
		Cuttack	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.40	73.18	60.40	
		Kondrapata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.40	73.24	56.42	
		Jagatsingpur	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.38	57.04	51.14	
Balasore	Balasore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	72.47	?		
	Chandab	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.33	55.04	51.73		
	Bhadrach	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	57.00	51.73		
	Norah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	48.00	51.73		
	Balasore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.37	59.50	51.73		
SOUTH WESTERN	Midnapore	Midnapore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.40	54.79	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.33	55.14	51.73	
		Contai	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.39	50.74	51.73	
		Saugor Island	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.32	48.00	51.73	
		Tumlook	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.30	46.20	51.73	
	24-Perkhanda	Diamond Harbour	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	1.01	63.70	51.73	
		Canning Town	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	57.57	51.73	
		Alipore Jail	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	57.57	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.36	53.12	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.39	65.13	51.73	
Howrah	Howrah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	50.44	51.73		
	Howrah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.04	51.73		
Hooghly	Serampore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	55.64	51.73		
	Howrah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	44.61	51.73		
MURDWA	Cuttack	Cuttack	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	41.32	51.73	
		Bhadrach	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	47.25	51.73	
		Cuttack	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	45.41	51.73	
		Bhadrach	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	55.55	51.73	
		Howrah	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	55.90	51.73	
BANGALORE	Bangalore	Bangalore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.04	51.73	
		Bangalore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.41	57.40	51.73	
		Bangalore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.39	65.13	51.73	
		Bangalore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	45.44	51.73	
		Bangalore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	44.10	51.73	
BARTHOLOMEW	Baran	Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.04	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	47.71	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.42	47.74	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	57.04	51.73	
		Baran	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	55.14	51.73	
NODDA	Nodda	Nodda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.37	50.74	51.73	
		Nodda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.71	42.00	51.73	
		Nodda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	49.84	51.73	
		Nodda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.13	51.73	
		Nodda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.41	50.00	51.73	
KHOWDA	Khowda	Khowda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	51.04	51.73	
		Khowda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	55.55	51.73	
		Khowda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Khowda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	51.73	
		Khowda	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	?	?	51.73	
JESSORE	Jessore	Jessore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.33	50.00	51.73	
		Jessore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Jessore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.34	55.55	51.73	
		Jessore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.24	55.55	51.73	
		Jessore	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.30	57.04	51.73	
MOORSHEDABAD	Moorshedabad	Moorshedabad	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Moorshedabad	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Moorshedabad	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Moorshedabad	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Moorshedabad	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
		Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	0.35	55.55	51.73	
KOLKATA	Kolkata	Kolkata	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil				

Statement of Rainfall in Bengal for the week ending Friday (8 a.m.), the 14th of February 1890—contd.

Administrative Division.	District.	Station.	RAINFALL							TOTAL		Total rain-fall since 1st of month.	Average total rain-fall from 1st of month.	Total rain-fall since 16th May 1889.	Average rainfall from 16th May to date.	
			Saturday, 8th February.	Sunday, 9th February.	Monday, 10th February.	Tuesday, 11th February.	Wednesday, 12th February.	Thursday, 13th February.	Friday, 14th February.	Number of rainy days.	of Rainfall week.					
NORTH-BENGAL	Noakhally	Gournadi	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	61.31	.....
		Mouphai	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	63.12	.....
		Noakhally	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.00	102.54	154.40
		Penny	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.03	79.93	101.40
	Furzedpore	Harishpore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	86.52	.....
		Ramganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	86.75	.....
	Dacca	Madairpore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.00	62.89	50.91
		Furzedpore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.00	62.89	50.91
	Hill Tipperah	Goulundo	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.11	65.95	50.71
		Munshiganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.70	77.51	70.74
		Dacca	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.00	77.45	69.01
		Narainganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.56	80.74	69.65
NORTH-BENGAL	Tipperah	Manickganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.56	69.67	50.50
		Joydebpore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.56	69.67	50.50
		Asaria	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.68	64.78	62.25
		Comilla	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.69	62.97	56.51
	Mymensingh	Chandpore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.51	65.97	75.40
		Bahmunbaria	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.83	51.12	62.54
		Ramchandrapore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	59.82	.....
		Nasirganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	62.54	.....
	Mymensingh	Daudkand	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.71	.....
		Kasba	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	62.44	.....
		Latham	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.71	.....
		Kishoreganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.61	70.89	70.71
NORTH-BENGAL	Pabna	Atia (Tangra)	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.60	60.60	50.00
		Mymensingh	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.60	60.60	50.00
		Jamulpore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.84	70.71	70.71
		Netrakona	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0.41	120.45	73.15
	Durgapore	Subornakhali	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Durgapore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Shorepore	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Tolen	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	NORTH-BENGAL	Durgapore	Dowanganj	Nil	Nil	Nil	0	60.60
			Dowanganj	Nil	Nil	Nil	0	60.60
Dowanganj			.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
Dowanganj			.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
Durgapore		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
Durgapore		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
NORTH-BENGAL	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
NORTH-BENGAL	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
NORTH-BENGAL	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
NORTH-BENGAL	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
NORTH-BENGAL	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
NORTH-BENGAL	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
	Durgapore	Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....	.....	.....	.....	.....	.....	.....	Nil	Nil	Nil	0	60.60	.....
		Dowanganj	.....												

Meteorological Division.	District.	Station.	RAINFALL.							TOTAL.		Total rain-fall since 1st of month.	Average total rain-fall from 1st of month.	Total rain-fall since 1st May 1889.	Average rain-fall from 1st May date.
			Saturday, 9th February.	Sunday, 9th February.	Monday, 10th February.	Tuesday, 11th February.	Wednesday, 12th February.	Thursday, 13th February.	Friday, 14th February.	Number rainy days.	Rainfall week.				
NORTH BHAR - concluded	Chumparan	Mothari	Nd	Nd	Nd	0.32	75.33		
		Hettah	Nd	Nd	Nd	0.27	55.37		
		Banoh	Nd	Nd	Nd	?	70.24		
		Barharwa	Nd	Nd	Nd	?	51.70		
	Saron	Gopalgunge	Nd	Nd	Nd	0.26	30.46		
		Nd	Nd	Nd	0.20	43.20		
		Chuprah	Nd	Nd	Nd	0.26	40.74		
		Bihar	Nd	Nd	Nd	0.34	47.44		
	Shahabad	Bahra	Nd	Nd	Nd	0.10	41.03		
		Bahra	Nd	Nd	Nd	0.26	38.10		
		Bahra	Nd	Nd	Nd	0.33	39.41		
		Bahra	Nd	Nd	Nd	0.29	48.00		
Gya	Aurangabad	Nd	Nd	Nd	0.10	35.42			
	Gya	Nd	Nd	Nd	0.34	39.43			
	Nd	Nd	Nd	0.30	39.50			
	Nd	Nd	Nd	0.26	33.40			
Patna	Patna	Nd	Nd	Nd	0.28	51.40			
	Patna	Nd	Nd	Nd	0.23	45.50			
	Patna	Nd	Nd	Nd	0.32	41.48			
	Patna	Nd	Nd	Nd	0.33	33.53			
Monkhyr	Monkhyr	Nd	Nd	Nd	0.35	47.02			
	Monkhyr	Nd	Nd	Nd	0.35	41.07			
	Monkhyr	Nd	Nd	Nd	0.34	39.44			
	Monkhyr	Nd	Nd	Nd	?	43.92			
South Bhawal pore	South Bhawal pore	Nd	Nd	Nd	0.27	45.06			
	South Bhawal pore	Nd	Nd	Nd	0.27	35.34			
	South Bhawal pore	Nd	Nd	Nd	?	46.27			
	South Bhawal pore	Nd	Nd	Nd	?	?			
Mouthal Per gunnahs.	Mouthal Per gunnahs.	Nd	Nd	Nd	0.18	89.00			
	Mouthal Per gunnahs.	Nd	Nd	Nd	0.35	49.04			
	Mouthal Per gunnahs.	Nd	Nd	Nd	0.20	73.50			
	Mouthal Per gunnahs.	Nd	Nd	Nd	0.41	50.77			
Chutia Nag. PPE.	Chutia Nag. PPE.	Nd	Nd	Nd	0.48	40.40			
	Chutia Nag. PPE.	Nd	Nd	Nd	0.25	44.24			
	Chutia Nag. PPE.	Nd	Nd	Nd	?	54.41			
	Chutia Nag. PPE.											

Explanation.—Indicates that no rain has fallen. If the return for any day has not been received, the corresponding space is left blank. If any of the returns are wanting, the corresponding spaces in the total rainfall column are left blank.

CALCUTTA, the 18th February 1890.

**SUMMARY OF THE RAINFALL AND METEOROLOGICAL OBSERVATIONS
TAKEN IN BENGAL FOR THE WEEK ENDING FRIDAY, THE 14TH
FEBRUARY 1890.**

In the report on the meteorology of the previous week it was remarked that conditions had been fairly normal, but that towards the close of that period, the northerly wind current blowing over Bengal was beginning to fall off in force, and light southerly winds and calms were being reported at the southerly stations; so that there was a decided tendency for humidity and temperature to rise. At the commencement of the present week, that is on the 8th, the very light northerly wind current continued, pressure rose, and became generally about a twentieth of an inch above the normal, while temperature also rose distinctly and became on the whole nearly normal; though the western stations recorded temperatures in excess and the eastern stations were in defect of the normal. Conditions remained practically unchanged on the 9th, except that pressure and temperature had again risen slightly, so that generally on this day both temperature and pressure were in excess of the normal. On the 10th, winds became less regular in direction, and at some of the southern and western stations south-westerly winds were blowing, pressure and temperature again continued to rise, and were both very considerably in excess of the normal, while also the southerly winds brought up considerable amounts of moisture to the province. On the 11th rather variable and light winds were reported in most districts, and pressure continued to rise at almost all stations; but in the case of temperature there was a rather rapid fall, particularly in Behar, the fall in the mean temperature in several cases in this district equalling from 3° to 5° ; but notwithstanding this, both temperature and pressure were both generally distinctly in excess of the normal. On the 12th a rapid fall of pressure commenced, amounting generally to about a twentieth of an inch, and on this date the fall of temperature had spread from Behar to South Bengal and Orissa, where on this day temperature was 2° to 3° below the normal, though in other parts of the province there was a distinct excess. On the 13th variable and light winds were generally reported, pressure again fell rapidly, the fall averaging about three-hundredths of an inch, while temperature had risen over the greater part of the province. On the 14th southerly winds were reported over a considerable part of the province, pressure again fell rapidly, the fall exceeding a twentieth of an inch at many stations, and thus became from about a twentieth to nearly a tenth of an inch below the normal over a considerable part of the province; temperature also again rose and became from about 2° to 7° in excess of the normal for the day, the excess at such stations as Arrah, Buxar, and Dehree averaging more than six degrees.

It will thus be seen that though there have been no very large changes in the meteorological conditions from day to day during the week, yet there has been a slow but steady tendency towards the disappearance of the north-east monsoon or cold weather conditions, and to the gradual establishment of the conditions which accompany or immediately precede the transition conditions which obtain between the hot and cold seasons. Throughout the week, therefore, the general tendency has been towards increasing temperature accompanied by rather high humidity at the southern stations and for the gradual establishment of southerly winds over the same area.

Pressure.—Notwithstanding the low pressures recorded at the close of the week, the mean pressure for the period has been in excess of the normal by amounts which average between two and four-hundredths of an inch, this excess pressure being fairly equally distributed over the whole province.

Temperature.—Has on the average of the whole week been about 3° in excess of the normal in South Behar and Chutia Nagpur, about a degree above the normal in North Behar, and about 2° above it in North Bengal; while in East and South-West Bengal and in Orissa the average mean temperature for the week has been nearly normal.

The actual temperatures during the week, the range from day to night, and their variations from their normal values are best seen in the following table, where the average maximum, minimum and mean temperatures at nine typical stations in different districts of the province are given, together with their normal values. It will be seen that the day temperatures for the week have been generally rather largely in excess of the normal, while the night temperatures have been more nearly normal, and in some cases even below it:—

Table showing the excess or defect of the actual mean temperature from the normal for the week ending 14th February 1890.

	Normal mean maximum temperature for the week ending 14th February.	Actual mean maximum temperature for the week ending 14th February 1890.	Variation of actual mean from the normal.	Normal mean minimum temperature for the week ending 14th February.	Actual mean minimum temperature for the week ending 14th February 1890.	Variation of actual mean from the normal.	Normal mean daily temperature for the week ending 14th February.	Actual mean daily temperature for the week ending 14th February 1890.	Variation of actual mean from the normal.
Outlook	88.9	89.2	+0.3	64.2	64.7	+0.5	76.5	77.0	+0.5
Calcutta	80.3	81.0	+0.7	59.2	59.6	+0.4	69.7	69.8	+0.1
Dacca	80.8	82.0	+1.2	59.0	59.7	+0.7	69.8	69.4	-0.4
Hurdwan	81.7	84.4	+2.7	57.4	58.4	+1.0	69.6	69.0	-0.6
Patna	78.0	80.2	+2.2	51.3	51.3	+0.0	64.0	66.0	+2.0
Gya	79.1	80.1	+1.0	55.4	55.7	+0.3	67.6	68.4	+0.8
Barnack	76.7	79.8	+3.1	49.3	47.0	-2.3	62.7	65.4	+2.7
Meerut	79.0	79.8	+0.8	52.7	52.0	-0.7	65.8	67.4	+1.6
Derjooling	48.0	50.7	+2.7	31.0	33.4	+2.4	37.7	39.2	+1.5

Rainfall.—Except for a few drops of rain at Darjeeling on the 8th, the whole province has been rainless throughout the week.

The following table gives the summary of the temperature and rainfall data of each of the seven meteorological divisions of the province for the week ending Friday, the 14th of February 1890 :—

METEOROLOGICAL DIVISIONS.	TEMPERATURE							RAINFALL								
	Highest observed during week.	Lowest observed during week.	Averages for week.			Average mean of week above or below normal mean of week.	Of week.			Rainy days.			Since 1st of month.		Since 15th May 1889.	
			Of highest of each day.	Of lowest of each day.	Of mean for each day.		Average.	Normal average.	Variation.	Average number in week.	Normal average number in week.	Variation.	Average.	Normal average.	Average.	Normal average.
Orissa	80.4	53.5	84.4	62.6	73.0	- 0.4	Nil	0.24	-0.24	0.0	0.0	-0.0	Nil	0.48	68.10	53.04
South-West Bengal ...	80.3	47.6	83.5	55.2	69.4	+0.2	Nil	0.26	-0.26	0.0	0.0	-0.0	Nil	0.65	52.81	52.59
East Bengal	84.6	49.0	80.8	53.5	67.3	-0.4	Nil	0.34	-0.34	0.0	0.0	-0.0	Nil	0.69	70.50	74.00
North Bengal*	83.9	46.2	80.0	50.2	65.0	+1.8	Nil	0.21	-0.21	0.0	0.0	-0.0	Nil	0.33	73.54	70.76
North Behar*	87.4	44.9	79.0	47.7	63.3	+1.1	Nil	0.20	-0.20	0.0	0.0	-0.0	Nil	0.51	57.89	49.10
South Behar	89.3	40.0	82.1	52.0	67.3	+3.0	Nil	0.12	-0.12	0.0	0.0	-0.0	Nil	0.29	44.16	44.16
Chutia Nagpur	83.5	47.5	80.4	54.3	67.4	+2.8	Nil	0.34	-0.34	0.0	0.0	-0.0	Nil	0.47	43.08	50.94

* Julpiguri, Chupra and Chyabases not included.

METEOROLOGICAL OFFICE, BENGAL ;

The 18th February 1890.

A. PEDLER,

Meteorological Reporter to the Govt. of Bengal.

Results of the Barometrical and Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 9th to 15th February 1890.

MONTH.	Date.	Pressure at 10 A.M. corrected to 32 Fahr.	TEMPERATURE.					HYGROMETRY.				Rainfall past 24 hours.
			Daily mean.	Maximum.	Range.	Minimum.	Dry bulb at 10 A.M.	Wet bulb at 10 A.M.	Vapour tension at 10 A.M.	Dew point at 10 A.M.	Humidity at 10 A.M.	
		Inches.	"	"	"	"	"	"	Inches.	"	%	Inches.
Feb. 1890..	9th	30.020	70.0	83.1	25.2	56.9	74.6	63.5	.440	55.4	52	Nil
" " "	10th	30.040	69.0	82.5	25.2	57.3	74.6	64.0	.477	57.6	56	.....
" " "	11th	30.044	69.0	82.1	27.1	55.0	73.0	60.7	.360	49.9	43	.....
" " "	12th	30.097	67.4	81.0	29.0	52.0	70.8	60.2	.382	51.5	51	.....
" " "	13th	30.054	70.0	84.0	25.1	55.0	74.6	60.5	.440	55.4	52	.....
" " "	14th	30.044	73.4	85.9	25.0	60.0	75.4	67.0	.573	62.8	65	.....
" " "	15th	30.026	74.5	84.7	19.8	64.0	72.6	67.4	.510	59.6	70	.....

The mean 10 A.M. pressure of the seven days Inches. 30.060

The mean temperature of the seven days 70.6

The extreme variation of temperature 33.0

The maximum temperature 85.9

The mean 10 A.M. relative humidity of the seven days % 56

The total fall of rain from 9th to 15th February 1890 Inches. Nil

The daily mean temperatures are the crude means of maximum and minimum temperatures.

O. LITTLE,

For Meteorological Reporter to the Govt. of India.

METEOROLOGICAL OFFICE, INDIA ;

The 17th February 1890.

MEMORANDUM.

THE birth and death returns from the principal Municipalities in Bengal afford the following results for the week ending 1st February 1890:—

1. Births and deaths were registered in the proportions, respectively, of 21·7 and 23·7 per 1,000 of population, against 22·8 and 18·5 per 1,000, respectively, during the preceding week ending 25th January, indicating a falling off in the registration of births and a large increase in that of deaths.

2. The highest proportions of births and deaths were returned from the following Municipalities:—

Births.			Deaths.		
		Ratio per mille.			Ratio per mille.
Arrah	...	11·9	Poori	...	130·7
Narainganj	...	37·3	Serampore	...	68·9
Darjiling	...	37·0	Jessore	...	55·1
Serampore	...	35·3	Hughli and Chinsurah	...	44·3
Bhagulpore	...	35·3	Narainganj	...	41·4
Comillah	...	34·7	Comillah	...	38·5
Chupra	...	34·2	Utepara	...	37·7
Mouglhyr	...	33·4	Howrah	...	33·8
			Burdwan	...	33·6
			Midnapore	...	31·0
			Gya	...	30·7

3. The following table shows that, as compared with the results of the preceding week, there was a noticeable increase in the death-rates from fever and the maladies classed under the head of "Other causes," but only fractional differences in the case of the other diseases:—

		Ratio per mille during the weeks ending—	
		1st February 1890.	25th January 1890.
Cholera	...	2·2	1·8
Small-pox	...	6	3
Fever	...	9·3	7·9
Bowel-complaints	...	3·0	3·3
Injury	...	4	5
Other causes	...	7·3	4·7

4. Of the diseases above named, cholera, fever, bowel-complaints and "other causes" proved conspicuously fatal in the following Municipalities:—

Cholera.		Fever.		Bowel-complaints.		Other causes.	
	Ratio per mille.		Ratio per mille.		Ratio per mille.		Ratio per mille.
Poori	39·8	Jessore	49·0	Narainganj	16·5	Serampore	27·6
Narainganj	16·6	Comillah	30·8	Serampore	13·7	Midnapore	17·0
Serampore	9·8	Poori	21·0	Hughli and Chinsurah	13·1	Gya	13·7
Howrah	3·4			Burdwan	10·7	Chittagong	11·7
Gya	2·7					Poori	10·5

Small-pox continued to rage with virulence in the Poori Municipality, yielding a death-rate of as much as 21 per 1,000 of population.

5. The death-rates under the heads of Sex, Class and Age stood as follows:—

According to Sex.		According to Class		According to Age.	
	Ratio per mille.		Ratio per mille.		Ratio per mille.
Males	26·4	Christians	22·4	Under 1 year	147·5
Females	20·8	Hindus	24·9	1 and under 5 years	26·3
Ratio of male deaths to every 10 female deaths, calculated on the proportion such mortality bears to the total male and female population	180	Mahomedans	20·8	5 " 10 "	10·8
				10 " 15 "	9·2
				15 " 20 "	18·0
				20 " 30 "	12·6
				30 " 40 "	16·3
				40 " 50 "	23·3
				50 " 60 "	23·5
				60 years and upwards	79·1

W. H. GREGG, Dip. Publ. Health, Camb.,
Sanitary Commissioner for Bengal.

The 17th February 1890.

Statement showing the Results of the Registration of Births and Deaths in the principal Municipalities in Bengal during the week ending 1st February 1890.

DISTRICTS.	NAMES OF MUNICIPALITIES.	POPULATION.						MORTALITY ACCORDING TO—										Sex.			
		MALES.		FEMALES.		TOTAL.		DISEASE.										Males.		Females.	
		NUMBER OF—		RATIO PER 1,000 OF POPULATION PER ANNUM.		RATIO OF MALE BIRTHS TO EVERY 100 FEMALE BIRTHS.		DEATHS FROM—										RATIO PER 1,000 OF POPULATION PER ANNUM.		RATIO OF MALE DEATHS TO EVERY 100 FEMALE DEATHS.	
		Males.	Females.	Total.	Males.	Females.	Total.	Cholera.	Small-pox.	Scarlet.	Measles.	Whooping-cough.	Diphtheria.	Injury.	Other diseases.	All causes.	Ratio of deaths per 1,000 of population per annum in the previous week.	Males.	Females.	Ratio of male deaths to the total mortality.	Ratio of female deaths to the total mortality.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Burdwan	Burdwan	13,653	16,017	29,670	91	107	198	80	...	9	7	16	22	117	107	91	229	18	259	48.2	19
Midnapore	Midnapore	16,527	16,433	32,960	11	108	119	173	...	4	5	9	20	63	77	170	124	9	253	24.1	118
Hughli	Hughli and Chinsurah.	13,823	13,827	27,650	13	113	126	160	...	11	8	19	27	191	131	178	361	16	255	36.1	144
Barrackpore	Barrackpore	13,650	12,037	25,687	9	17	26	100	...	15	3	18	20	89	137	155	256	31	97.5	35.2	283
Calcutta	Calcutta	3,946	2,464	6,410	1	94	95	94	...	2	...	2	4	189	...	194	377	2	341	42.2	61
Howrah	Howrah	23,151	27,609	50,760	16	137	153	166	...	19	17	36	53	109	97	126	182	61	13	40.1	369
Ballia	Ballia	2,826	6,079	8,905	3	79	82	85	...	5	...	5	7	175	...	180	140	6	1	32.5	557
Khararhar	Khararhar	12,323	14,216	26,539	6	113	119	130	...	8	1	10	15	151	19	161	132	8	4	31.4	221
Rangpur	Rangpur	4,023	4,653	8,676	2	170	172	180	...	1	...	1	1	69	...	70	150	1	...	129	No female death.
Jessore	Jessore	18,704	18,919	37,623	1	33	34	35	...	1	...	1	1	12	...	13	175	1	...	32	No male death.
Rajshahye	Rajshahye	4,830	2,665	7,495	1	81	82	83	...	8	...	8	9	499	...	507	400	4	5	43.1	70.3
Darjiling	Darjiling	18,706	9,028	27,734	3	53	56	60	...	6	1	7	10	159	26	175	223	5	4	29.0	136
Dacca	Dacca	4,579	2,479	7,058	2	188	190	189	...	2	...	2	3	149	...	151	223	2	1	42.7	106
Chittagong	Chittagong	65,791	37,379	103,170	13	25	38	40	...	9	3	12	15	83	19	102	153	15	9	15.3	150
Tripurah	Tripurah	7,005	4,866	11,871	4	164	168	172	...	1	4	5	9	41	61	62	250	6	4	41.0	97
Patna	Patna	8,153	5,333	13,486	3	70	73	80	...	3	1	4	10	103	...	117	203	6	3	23.4	125
Gya	Gya	78,762	41,475	120,237	16	43	59	62	...	5	2	7	10	309	77	385	450	6	4	39.3	100
Shahabad	Shahabad	38,590	27,831	66,421	11	24	38	42	...	1	4	5	10	143	...	157	203	9	12	5.9	72
Moulvibazar	Moulvibazar	36,400	22,503	58,903	20	15	25	30	...	21	...	21	25	143	...	168	203	34	21	28.8	114
Darbhanga	Darbhanga	23,094	19,685	42,779	6	10	16	22	...	4	2	6	12	49	...	51	98	6	2	9.9	225
Saran	Saran	33,774	22,322	56,096	10	20	30	40	...	2	1	3	6	74	12	81	121	8	6	13.5	86
Shahdol	Shahdol	35,116	24,534	59,650	11	23	34	47	...	15	...	15	18	118	...	133	161	12	14	19.6	81
Shahdol	Shahdol	29,649	27,813	57,462	17	39	56	75	...	2	5	7	12	29	...	31	49	6	6	12.4	109
Monohar	Monohar	24,154	23,346	47,500	14	37	51	68	...	16	2	18	26	145	...	171	213	13	10	22.9	100
Purneah	Purneah	8,403	6,833	15,236	1	3	4	7	...	4	1	5	6	139	...	143	163	16	1	24.6	343
Poori	Poori	12,247	11,337	23,584	1	4	5	9	...	10	4	14	18	219	...	233	289	26	26	102.1	103
Total	Total	520,000	510,000	1,030,000	213	220	433	440	...	100	9	109	120	93	...	107	153	280	304	26.6	130

DISTRICTS.	NAMES OF MUNICIPALITIES.	Class.						Age.										Ratio per 1,000 of population per annum.									
		Deaths.						Under 1 year.										Under 1 year.									
		Christians.	Hindus.	Mohomedans.	Buddhists.	Other classes.	Ratio per 1,000 of population per annum.	Under 1 year.	1 and under years.	5 and under years.	10 and under years.	15 and under years.	20 and under years.	25 and under years.	30 and under years.	35 and under years.	40 and under years.	45 and under years.	50 and under years.	55 and under years.	60 and under years.	65 and under years.	70 and under years.	75 and under years.	80 and under years.	85 and under years.	90 and under years.
Burdwan	Burdwan	14	5	...	...	...	597	605	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Midnapore	Midnapore	13	7	...	...	...	291	504	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Hughli	Hughli and Chinsurah	22	5	...	...	...	453	472	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Serampore	Serampore	29	1	...	...	...	508	554	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Howrah	Howrah	43	15	...	...	...	301	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bali	Bali	6	1	...	...	...	213	397	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Kishoreganj	Kishoreganj	8	4	...	...	...	223	251	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baughat	Baughat	1	...	...	...	...	71	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Satipore	Satipore	1	...	...	...	...	25	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Jessore	Jessore	1	7	...	...	...	321	115	102	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Rajshahy	Rajshahy	7	3	...	...	...	367	159	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Darjiling	Darjiling	3	...	...	...	...	370	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Dacca	Dacca	14	10	...	...	...	191	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Narainganj	Narainganj	6	2	...	...	...	639	109	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Chittagong	Chittagong	1	8	...	...	...	90	272	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Tipperah	Tipperah	4	6	...	...	...	350	432	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Patna	Patna City	15	6	...	...	...	60	70	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Gya	Gya	30	2	...	...	...	372	291	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Shahabad	Shahabad	5	1	...	...	...	54	42	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Moulvibazar	Moulvibazar	6	4	...	...	...	139	187	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Burhanpur	Burhanpur	21	5	...	...	...	220	149	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Baran	Baran	7	5	...	...	...	92	218	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Bhagalpur	Bhagalpur	1	20	4	...	...	1347	532	191	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Monghyr	Monghyr	22	4	...	...	...	250	163	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Purneah	Purneah	2	3	...	...	...	113	270	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Poor	Poor	64	...	...	...	...	1017	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
TOTAL	TOTAL	3	303	115	...	...	224	240	208	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

W. H. GREGG, Dip. Publ. Health, Camb.,
Sanitary Commissioner for Bengal.

OFFICE OF SANITARY COMMISSIONER FOR BENGAL,
The 17th February 1890.

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.

Statements showing Quantities of Goods carried during the month of November 1889.

ORISSA CIRCLE.

TALDUNDA CANAL SYSTEM.

 LENGTH OF CANAL OPEN { TALDUNDA CANAL, 27 MILES.
 { MACHGONG .. 4 ..

Number of boats or rafts.	DESCRIPTION	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.	
		Quantity—Tons.		Value.	Quantity.	Value.
		Up.	Down.	Rupces.	Tons.	Rupces.
...	1. Grain	...	...	...	...	...
...	2. Cotton	...	...	...	...	...
1	3. Oilseeds	...	8	630	8	680
2	4. Salt	...	20	1,938	20	1,938
...	5. Piece-goods	...	...	...	...	...
...	6. Metal	...	...	...	...	...
2	7. Building materials	...	25	60	25	60
...	8. Miscellaneous	...	...	...	...	...
...	9. Fuel	...	...	...	...	...
3 rafts	10. Timber No.	...	43	70	43	70
2 "	11. Bamboos "	...	2,300	30	2,300	30
5 boats	12. Total	{	53 &	{ 2,728 }	53 &	{ 2,728 }
5 rafts.			2,343 No.			
10 boats	13. Total of same	{	52 &	{ 4,009 }	58 &	{ 4,009 }
5 rafts.			65 No.			
		Up.	Down.	Total.		Rs. A.
14. Total number of boats plying cargo	No.	...	5	5	Total tollage of month— 24 + 25 + 26	55 12
15. Total number of boats plying passenger	No.	5	...	5		
15½. Total empty boats		8	9	17	Total tollage of same month last year	133 14
16. Total registered tonnage, cargo, private	Tons	...	87	87		
16½. Ditto ditto, Govern- ment	Tons	...	...	...
17. Total registered tonnage, passenger	Tons	107	...	107		
17½. Ditto ditto, empty	Tons	51	140	191		
18. Ton-mileage		2,279	3,382	5,661		
19. Estimated value of cargo	Rs.	...	2,628	2,628		
20. Number of passengers		127	...	127		
21. Rafts, bamboos	No.	...	2,300	2,300		
22. Do., bullahs	"	...	43	43		
23. Estimated value of rafts	Rs.	...	100	100		
24. Tollage on boats		21-2-0	29-10-0	50-12-0		
25. Compounded tollage on boats	Rs.	...	...	...
26. Tollage on rafts	"	...	5-0-6	5-0-6		
27. Total tollage on boats per ton-mile	Rs.	...	...	0-0-1-88		
28. Total tollage on rafts per 100 cubic feet	Rs.	...	...	...
					Memorandum of Tollage.	
					1. Balance not recovered on the 1st of the month	Rs. A. P.
					2. Tollage per month	55 12
					3. Total	55 12
					4. Amount credited in the accounts of the month	43 4
					5. Balance due at the end of the month	12 8

KENDRAPARA CANAL SYSTEM.

LENGTH OF CANAL OPEN, 78 MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	
		Up.	Down.	Total.	Rupess.	Tons.	
78	1. Grain ...	213	553	766	39,460	766	39,460
7	2. Cotton ...	51	19	70	19,650	70	19,650
4	3. Oilseeds ...	9	19	28	2,210	28	2,210
13	4. Salt ...	6	30	36	2,870	36	2,870
2	5. Piece-goods ...	.....	46	46	2,800	46	2,800
...	6. Metal ...	.....	...	.....	.....	.....	.....
37	7. Building materials ...	.....	1,028	1,028	14,130	471	12,160
98	8. Miscellaneous ...	440	308	748	43,570	748	43,570
8	9. Fuel ...	19	5	24	160	24	160
3 rafts	10. Timber ...	.....	1,056 c. ft.	1,056 c. ft.	450	1,056 c. ft.	450
3 "	11. Bamboos ...	.....	3,550 "	3,550 "	160	3,550 "	160
247 & 6 rafts.	12. Total ...	{ 738	2,008 & 4,606 c. ft.	2,746 & 4,606 c. ft.	1,25,460	2,189 & 4,606 c. ft.	1,23,490
345 & 16 rafts.	13. Total of same month last year.	{ 1,083	1,475 & 77,289 No.	2,558 & 77,289 c. ft.	3,04,430	2,278 & 77,289 c. ft.	3,01,910
14	Total number of boats plying cargo No.	114	133	247	Total tollage of month— 24 + 25 + 26 ...		Ra. A. P. 4,784 5 3
15	Total number of boats plying passenger No.	52	57	109			
15½	Ditto empty boats "	191	130	321			
16	Total registered tonnage, cargo, private Tons	1,402	2,540	3,942	Total tollage of same month last year ...		4,657 12 8
16½	Ditto ditto, Government "	.....	826	826			
17	Total registered tonnage, passenger Tons	2,331	1,971	4,302			
17½	Ditto ditto empty boats "	1,361	569	1,930	Memorandum of Tollage.		Ra. A. P.
18	Ton-mileage ...	225,132	255,152	480,284			
19	Estimated value of cargo Re.	53,260	71,590	1,24,850			
20	Number of passengers ...	1,843	1,736	3,679	1. Balance not recovered on the 1st of the month ...		4,319 0 11
21	Rafts, bamboos C. ft.	.....	3,550	3,550			
22	Do., timber "	...	1,056	1,056			
23	Estimated value of rafts Re.	.....	610	610	2. Tollage per month ...		4,784 5 3
24	Tollage on boats "	1,874-7-10	2,875-10-9	4,750-2-7			
25	Compounded tollage on boats Re.	.....	.....	.....
26	Tollage on rafts ,	.....	34-2-8	34-2-8	Amount erroneously charged now written back ...		2 7 0
27	Total tollage on boats per ton-mile	.....	.....	0-0-1-9			
28	Total tollage on rafts per 100 cubic feet	.....	.....	0-11-10			
					3. Total ...		9,100 16 2
					4. Amount credited in the accounts of the month ...		5,057 1 5
					5. Balance due at the end of the month ...		4,043 13 9

HIGH LEVEL CANAL, RANGE 2.

LENGTH OF CANAL OPEN, 32 MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.			Quantity.	Value.	
		Up.	Down.	Total.	Tons.	Rupees.	
45	1. Grain ...	118	...	118	118	10,130	10,130
4	2. Cotton ...	8	2	10	10	3,000	3,000
11	3. Oilseeds ...	51	...	51	51	4,150	4,150
46	4. Salt ...	...	136	136	136	11,400	11,400
...	5. Piece-goods ...	...	...	...	...	...	...
...	6. Metal ...	...	...	...	...	...	...
49	7. Building materials ...	39	387	426	73	1,750	1,470
38	8. Miscellaneous ...	70	35	105	105	9,690	9,690
14	9. Fuel ...	110	...	110	110	310	310
...	10. Timber ...	...	...	...	...	...	...
...	11. Bamboos ...	...	...	...	...	...	...
207	12. Total ...	396	560	956	603	40,430	40,150
175 & 4 rafts.	13. Total of same month last year ...	494 & 638 No.	113	607 & 638 No.	607 & 638 No.	42,340	42,340

	Up.	Down.	Total.		Rs. A. P.
14. Total number of boats plying cargo No.	106	101	207	Total tollage of month— 24 + 25 + 26 ...	557 15 4
15. Total number of boats plying passenger No.	7	6	13	Total tollage of same month last year ...	451 1 9
15½. Ditto empty boats ..	37	84	121	Memorandum of Tollage.	
16. Total registered tonnage, cargo, private Tons	731	469	1,200		
16½. Ditto ditto, Government ..	...	499	499		Rs. A. P.
17. Total registered tonnage, passenger Tons	79	76	155	1. Balance not recovered on the 1st of the month ...	70 14 6
17½. Ditto empty boats ..	122	377	499		
18. Ton-mileage ...	26,900	29,014	55,914		
19. Estimated value of cargo Rs.	22,760	17,670	40,430	2. Tollage per month ...	557 15 4
20. Number of passengers ...	39	35	74		
21. Rafts, bamboos C. ft	.....	.....	.....
22. Do., timber ..	.....	.....	.....	3. Total ...	628 13 10
23. Estimated value of rafts Rs.	.....	...	.....
24. Tollage on boats ..	303-0-7	254 14-9	557-15-4	4. Amount credited in the accounts of the month	327 7 4
25. Compounded tollage on boats Rs.	.....	.....	.....
26. Tollage on rafts ..	.....	...	.....
27. Total tollage on boats per ton-mile Rs.	.....	.....	0-0-1-9	5. Balance due at the end of the month ...	301 6 6
28. Total tollage on rafts per 100 cubic feet Ra.	.....	.....	.....

HIGH LEVEL CANAL, RANGE II.

LENGTH OF CANAL OPEN, 12½ MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	
		Up.	Down.	Total.	Rupees.	Tons.	
10	1. Grain ..	17	4	21	895	21	895
2	2. Cotton ...	6	5	11	1,037	11	1,037
1	3. Oilseeds ..	.....	1	1	14	1	14
2	4. Salt ...	.....	6	6	770	6	770
12	5. Piece-goods ...	.....	15	15	4,060	15	4,060
1	6. Metal ...	3	.....	3	260	3	260
49	7. Building materials ...	.....	434	434	297	4	79
4	8. Miscellaneous ...	6	9	15	2,345	15	2,345
1	9. Fuel ...	.....	3	3	9	3	9
7 rafts	10. Timber ...	.....	1,374 c. ft.	1,374 c. ft.	687	1,374 c. ft.	687
...	11. Bamboos ...	.....	.....	.....	.....	.....	.....
82 & 7 rafts.	12. Total ...	32	477 & 1,374 c. ft.	509 & 1,374 c. ft.	10,374	79 & 1,374 c. ft.	10,156
80 & 2 rafts.	13. Total of same month last year.	122	159 & 28 No.	281 & 28 No.	15,767	173½ & 28 No.	15,517
		Up.	Down.	Total.			Rs. A. P.
14.	Total number of boats plying cargo ... No.	10	72	82	Total tollage of month— 24 + 25 + 26 ...		226 5 9
15.	Total number of boats plying passenger ... No.	3	3	6			
154.	Ditto empty boats ..	64	10	74	Total tollage of same month last year ...		140 12 8
16.	Total registered tonnage, cargo and boat Tons	64	954	1,018			
164.	Ditto Govt. boat ..	.....	860	860	Memorandum of Tollage.		
17.	Total registered tonnage, passenger Tons	18	8	26			
174.	Ditto ditto empty ..	383	31	414			
18.	Ton-mileage ...	5,261	11,124	16,385	1. Balance not recovered on the 1st of the month ...		.....
19.	Estimated value of cargo Ra.	1,496	8,191	9,687			
20.	Number of passengers ...	101	265	366	2. Tollage per month ...		226 5 9
21.	Rafts, bamboos C. ft.	.....	.....	.....
22.	Do., bullahs ..	.....	1,374	1,374	3. Total ...		226 5 9
23.	Estimated value of rafts Ra.	.....	687	687			
24.	Tollage on boats ..	43-12-3	171-8-9	215-5-0	4. Amount credited in the accounts of the month ...		202 2 3
25.	Compounded tollage on boats Ra.	.....	.....	.....
26.	Tollage on rafts ..	.....	11-0-9	11-0-9			
27.	Total tollage on boats per ton-mile Ra.	.....	.....	0-0-2-52	5. Balance due at the end of the month ...		24 3 6
28.	Total tollage on rafts per 100 cubic feet Ra.	.....	.....	0-12-9			

HIGH LEVEL CANAL, RANGE III.

LENGTH OF CANAL OPEN, 19 MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	
		Up.	Down.	Total.	Rupees.	Tons.	
1	1. Grain ...	3½	.....	3½	96	3½	96
...	2. Cotton ...	.....	.....	.....	.....	.....	.....
...	3. Oilseeds ...	.....	.....	.....	.....	.....	.....
1	4. Salt ...	.....	8½	8½	948	8½	948
...	5. Piece-goods ...	.....	.....	.....	.....	.....	.....
...	6. Metal ...	.....	.....	.....	.....	...	.....
22	7. Building materials ...	.....	218	218	74	.....	.....
...	8. Miscellaneous ...	.....	.....	.....	.....	.....	.....
...	9. Fuel ...	.....	.....	.....	.....	.....	.....
14 rafts	10. Timber ...	.....	2,064 c. ft.	2,064 c. ft.	691	2,064 c. ft.	691
2 "	11. Bamboos ...	.....	125 No.	125 No.	3	125 No.	8
24 & 16 rafts.	12. Total ...	{ 3½	{ 226½ & 2,064 c. ft. 125 No.	{ 230 & 2,064 c. ft. 125 No.	{ 1,812	{ 12 & 2,064 c. ft. 125 No.	{ 1,738
32 & 7 rafts.	13. Total of same month last year.	{ 62	{ 24 & 159 No.	{ 86 & 159 No.	{ 6,115	{ 86 & 159 No.	{ 6,115
		Up.	Down.	Total.			Rs. A. P.
14.	Total number of boats plying cargo No.	1	23	24	Total tollage of month— 24 + 25 + 26 ...		109 0 9
15.	Total number of boats plying passenger No.	...	.....	.....	Total tollage of same month last year ...		49 8 6
15½.	Ditto empty ditto "	24	2	26			
16.	Total registered tonnage, cargo, including boat Tons	7	453	460			
16½.	Ditto Govt. ditto "	...	436	436	Memorandum of Tollage.		
17.	Total registered tonnage, passenger Tons	.....	.....	.....
17½.	Ditto empty ditto "	172	2	174			Rs. A. P.
18.	Ton-mileage ...	379	632	1,011	1. Balance not recovered on the 1st of the month ...		.....
19.	Estimated value of cargo Rs.	96	1,022	1,118			
20.	Number of passengers ...	207	220	427	2. Tollage per month ...		109 0 9
21.	Rafts, bamboos No	.....	125	125			
22.	Do., bullahs C. ft.	...	2,064	2,064	3. Total ...		109 0 9
23.	Estimated value of rafts Rs.	.....	694	694			
24.	Tollage on boats "	15-4-6	77-11-6	93-0-0	4. Amount credited in the accounts of the month ...		95 1 6
25.	Compounded tollage on boats Rs.	.....	.....	.....
26.	Tollage on rafts "	.....	16-0-9	16-0-9			
27.	Total tollage on boats per ton-mile Rs.	.....	.....	0-1-5-66			
28.	Total tollage on rafts per 100 cubic feet Rs.	.....	.....	0-12-4	5. Balance due at the end of the month ...		18 15

JAJEPORE CANAL.

LENGTH OF CANAL OPEN, 6½ MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		REMARKS.	
		Quantity—Tons.			Value.	Quantity.	Value.		
		Up.	Down.	Total.	Rupees.	Tons.	Rupees.		
2	1. Grain ...	.....	7	7	297	7	297	
1	2. Cotton ...	.....	2½	2½	700	2½	700	
...	3. Oilseeds ...	.....	.....	.....	.....	.....	.....
...	4. Salt ...	.....	.....	.....	.....	.....	.....
1	5. Piece-goods ...	.....	1	1	500	1	500	
...	6. Metal ...	.....	.....	.....	.....	.....	.....
...	7. Building materials ...	.....	.....	.....	.....	.....	.....
33	8. Miscellaneous ...	.....	16	16	1,769	16	1,769	
1	9. Fuel ...	4	.....	4	28	4	28	
7 rafts.	10. Timber ...	.....	708 c. ft.	708 c. ft.	111	708 c. ft.	111	
...	11. Bamboos ...	.....	.....	.....	.....	.....	.....
38 & 7 rafts.	12. Total ...	{ 4	26½ & 708 c. ft.	30½ & 708 c. ft. }	3,405	{ 30½ & 708 c. ft. }	3,405		
7 & 4 rafts.	13. Total of same month last year.	{ 29 & 48 No.	3	32 & 48 No.	1,081	{ 8 & 48 No. }	1,039		
		Up.	Down.	Total.				Rs. A. P.	
4.	Total number of boats plying cargo No.	1	37	38	Total tollage of month—24 + 25 + 26 ...			15 14 0	
5.	Total number of boats plying passenger No.	1	2	3	Total tollage of same month last year ...			9 1 4	
5½.	Ditto empty boats ..	30	5	35	Memorandum of Tollage.				
6.	Total registered tonnage, cargo and boat Tons	8	53	61					
6½.	Ditto Govt. boat ..	4	4	8					
7.	Total registered tonnage, passenger Tons	5	10	15	Rs. A. P.				
7½.	Ditto, empty boats ..	39	25	64					
8.	Ton-mileage ...	172	511	683				1. Balance not recovered on the 1st of the month
9.	Estimated value of cargo Rs.	28	3,266	3,294				2. Tollage per month ..	15 14 0
9.	Number of passengers ...	30	20	50				3. Total ...	15 14 0
10.	Rafts, bamboos C. ft.	.....	.....	.....	Rs. A. P.			
10.	Do., bullahs ..	.....	708	708				
11.	Estimated value of rafts Rs.	111	111				4. Amount credited in the accounts of the month ...	0 0 0
12.	Tollage on boats ..	3-15-0	9-12-6	13-11-6				5. Balance due at the end of the month ...	15 8 0
13.	Compounded tollage on boats Rs.	.....	.....	.....		
14.	Tollage on rafts ..	.....	2-2-6	2-2-6				
15.	Total tollage on boats per ton-mile Rs.	.....	.....	0-0-3-85				
16.	Total tollage on rafts per 100 cubic feet Rs.	.....	.....	1-1-3				

SOUTH-WESTERN CIRCLE.
MIDNAPORE CANAL.
LENGTH OF CANAL OPEN, 53 MILES

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.	Rupces.	Tons.	Rupces.	
711	1. Grain ...	3,957	376	4,333	2,42,149	4,333	2,42,149	
2	2. Cotton ...	.....	4	4	1,800	4	1,800	
16	3. Oilseeds ...	90	72	162	15,234	162	15,234	
91	4. Salt ...	.....	437	437	83,845	437	83,845	
9	5. Piece-goods ...	8	106	114	3,10,770	114	3,10,770	
17	6. Metal ...	102	85	187	1,51,986	187	1,51,986	
20	7. Building materials ...	120	8	128	904	128	904	
299	8. Miscellaneous ...	877	667	1,544	2,80,994	1,544	2,80,994	
29	9. Fuel ...	54	355	409	4,890	409	4,890	
90 rafts	10. Timber ...	19,520 c. ft.	40 c. ft.	19,560 c. ft.	10,668	19,560 c. ft.	10,668	
6 "	11. Bamboos ...	1,798 "	100 "	1,898 "	182	1,898 "	182	
1,194 & 96 rafts.	12. Total ...	{ 5,208 & 21,318 c. ft.	{ 2,110 & 140 c. ft.	{ 7,318 & 21,458 c. ft.	{ 11,03,422	{ 7,318 & 21,458 c. ft.	{ 11,03,422	
1,617 & 111 rafts.	13. Total of same month last year.	{ 6,317 & 33,598 c. ft.	{ 2,132 & 106 c. ft.	{ 8,449 & 33,704 c. ft.	{ 10,66,455	{ 8,449 & 33,704 c. ft.	{ 10,66,455	
		Up.	Down.	Total.				Rs. A. P.
14.	Total number of boats plying cargo No.	895	299	1,194	Total tollage of month—24 + 25 + 26 ...			9,356 8
15.	Total number of boats plying passenger No.	538	605	1,143	Total tollage of same month last year			10,992 16
15½.	Ditto empty "	439	649	1,088				
16.	Total registered tonnage, cargo Tons	11,518	4,567	16,085	Memorandum of Tollage.			
17.	Total registered tonnage, passenger Tons	3,812	3,730	7,542				
17½.	Ditto empty "	1,898	3,138	5,036				Rs. A. P.
18.	Ton-mileage	358,930	207,163	566,093	1. Balance not recovered on the 1st of the month ...			2,907 14
19.	Estimated value of cargo Ra.	4,56,942	6,35,630	10,92,572	2. Tollage per month ...			9,356 8
20.	Number of passengers	4,957	10,478	15,435				
21.	Rafts, bamboos C. ft.	1,798	100	1,898				
22.	Do., bullahs "	19,520	40	19,560	3. Total ..			12,264 6
23.	Estimated value of rafta Ra.	10,738	112	10,850				
24.	Tollage on boats "	5,948-5-3	3,084-3-0	9,032-8-3				
25.	Compounded tollage on boats Ra	.....	.....	...	4. Amount paid into Treasury during the month ...			6,953 10
26.	Tollage on rafts "	323	1	324				
27.	Total tollage on boats per ton-mile Ra.	.....	.....	0-0-3				
28.	Total tollage on rafta per 100 cubic feet Ra.	.....	.....	1-8-2	5. Balance due at the end of the month ...			5,310 11

HIDGELLER TIDAL CANAL.

LENGTH OF CANAL OPEN, 29 MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.	Rupers.	Tons.	Rupers.	
107	1. Grain ...	618	390	1,008	1,08,979	1,008	1,08,979	
...	2. Cotton ...	.....	.....	.....	.....	.....	.....
5	3. Oilseeds ...	7	7	14	1,100	14	1,100	
22	4. Salt ...	.....	156	156	17,540	156	17,540	
4	5. Piece-goods ...	.....	7	7	9,600	7	9,600	
1	6. Metal ...	.....	3	3	200	3	200	
9	7. Building materials ...	11	37	48	392	48	392	
599	8. Miscellaneous ...	628	260	888	82,621	888	82,621	
9	9. Fuel ...	3	74	77	960	44	530	
27 rafts	10. Timber ...	592 c. ft.	3,469 c. ft.	4,061 c. ft.	4,130	4,061 c. ft.	4,130	
...	11. Bamboos ...	.....	.....	.....	.....	.....	.....
756 & 27 rafts	12. Total ..	{ 1,267 & 592 c. ft.	{ 934 & 3,469 c. ft.	{ 2,201 & 4,061 c. ft. }	2,25,522 {	{ 2,168 & 4,061 c. ft. }	{ 2,25,092	
1,107 & 25 rafts.	13. Total of same month last year.	{ 2,431 & 977 c. ft.	{ 488 & 11,932 c. ft.	{ 2,919 & 12,909 c. ft. }	1,90,994 {	{ 2,919 & 12,909 c. ft. }	{ 1,90,994	
		Up.	Down.	Total.				
4.	Total number of boats plying cargo No.	341	415	756	Total tollage of month— 24 + 25 + 26 ...			
5.	Total number of boats plying passenger No.	57	59	116	Total tollage of same month last year			
6.	Total registered tonnage, cargo Tons	3,125	3,074	6,199				
7.	Total registered tonnage, passenger Tons	436	551	987	Memorandum of Tollage.			
8.	Ton-mileage ...	58,218	65,642	123,860	Rs. A. P.			
9.	Estimated value of cargo Rs.	86,259	135,133	2,21,392				
10.	Number of passengers ...	896	1,527	2,423	1. Balance not recovered on the 1st of the month ...			
11.	Rafts, bamboos C. ft.	.....	.....	.....	1,743 4 9			
12.	Do., bullahs ..	592	3,469	4,061	2. Tollage per month ...			
13.	Estimated value of rafts Rs.	619	3,520	4,130	2,258 1 9			
14.	Tollage on boats ..	1,018-11-3	1,147-6-9	2,166-2-0	3. Total ...			
15.	Compounded tollage on boats Rs.	.....	0-5-6	0-5-6	4,001 6 6			
16.	Tollage on rafts ..	9-5 3	82-5-0	91-10-3	4. Amount paid into Treasury during the month			
17.	Total tollage on boats per ton-mile Rs.	.....	.....	0-0-3 3	2,364 9 9			
18.	Total tollage on rafts per 100 cubic feet Rs.	.....	.....	2-4-1	5. Balance due at the end of the month			
					1,636 12 9			

SONE CIRCLE.

PATNA CANAL SYSTEM.

LENGTH OF CANAL OPEN, 86½ MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE			PRIVATE.		REMARKS.
		Quantity—Tons.		Value.	Quantity.	Value.	
		Up.	Down.	Total.	Tons.	Rupees.	
7	1. Grain ..	1	79	80	80	4,812	
...	2. Cotton ..	.....	.....	.....	.....	.....
1	3. Oilseeds ..	.....	17	17	17	1,812	
4	4. Salt ..	71	.....	71	71	5,666	
28	5. Piece-goods ..	192	11	203	203	36,324	
3	6. Metal ..	33	.....	33	33	2,456	
10	7. Building materials ..	7	67	74	45	200	
42	8. Miscellaneous ..	99	253	352	260	58,992	
...	9. Fuel ..	.....	.....	.....	.....	.....
...	Do. ..	.....	33	33	33	295	
6	10. Timber ..	99	.....	99	.....	3,520	
...	Do. ..	.....	52	52	52	553	
...	11. Bamboos ..	.....	84	84	84	1,294	
101	12. Total ..	502	596	1,098	878	1,16,518	
176	13. Total of same month last year ..	474	1,312	1,786	1,403	1,84,333	
		Up.	Down.	Total.			Rs. A. P.
14.	Total number of boats plying cargo No.	54	47	101	Total tollage of month— 24 + 25 + 26		1,131 5 6
15.	Total number of boats plying passenger No.	9	15	24			
15½.	Ditto empty "	46	38	84	Total tollage of same month last year		1,760 2 6
16.	Total registered tonnage, cargo Tons	838	664	1,502			
17.	Total registered tonnage, passenger Tons	140	189	329			
17½.	Ditto empty "	217	166	383	Memorandum of Tollage.		
18.	Ton-mileage	68,310	61,990	130,300			Rs. A. P.
19.	Estimated value of cargo Rs.	55,738	58,638	1,14,376	1. Balance not recovered on the 1st of the month		135 11 10
20.	Number of passengers	386½	599	985½	2. Tollage per month		1,131 5 6
21.	Rafts, bamboos C. ft.	.....	12,610	12,610	3. Total		1,267 1 4
22.	Do., bullahs "	.....	6,372	6,372			
23.	Estimated value of rafts Rs.	.....	2,142	2,142			
24.	Tollage on boats	564-0-9	333-6-6	897-7-3	4. Amount credited in the accounts of the month		940 4 6
25.	Compounded tollage on boats Rs.	75-0-0	75-0-0	150-0-0			
26.	Tollage on rafts	.....	83-14-3	83-14-3			
27.	Total tollage on boats per ton-mile	.....	.....	0-0-1-56			
28.	Total tollage on rafts per 100 cubic feet	.....	.....	0-7-0	5. Balance due at the end of the month		317 13 6

ARRAH CANAL SYSTEM.

LENGTH OF CANAL OPEN, 65 MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		Private.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.	Rupees.	Tons.	Rupees.	
11	1. Grain ...	.....	149	149	11,789	149	11,789	
	2. Cotton ...	.....	.....	.....	.....	.....	.....
	3. Oilseeds ...	1	1	2	492	2	492	
27	4. Salt ...	377	...	377	44,886	377	44,886	
	5. Piece-goods ...	24	4	28	39,650	28	39,650	
1	6. Metal ...	5	.....	5	20,640	5	20,640	
7	7. Building materials ...	.....	84	84	348	77	328	
119	8. Miscellaneous ...	22	889	911	36,87	158	35,560	
8	9. Fuel ...	57	54	111	1,300	54	750	
	10. Timber ...	2	2	4	435	4	435	
	Do. ...	...	2	2	415	2	415	
	11. Bamboos ...	.....	23	23	377	23	377	
	Bullaha ...	.....	8	8	125	8	125	
	Firewood ...	.....	680	680	4,918	680	4,918	
173	12. Total ...	488	1,806	2,384	1,61,962	1,562	1,60,365	
148	13. Total of same month last year.	590	1,373	1,963	1,92,312	1,547	1,87,489	
		Up.	Down.	Total.			Rs. A. P.	
4.	Total number of boats plying cargo No.	36	137	173	Total tollage of month— 24 + 25 + 26 ...		1,185 13 6	
5.	Total number of boats plying passenger No.	...	2	2				
6.	Total number of empty boats No.	87	7	94	Total tollage of same month last year ...		1,502 4 11	
7.	Total registered tonnage, cargo Tons	830	2,134	2,964				
8.	Total registered tonnage, passenger Tons	65	67	132				
9.	Total registered tonnage, empty Tons	400	26	426	Memorandum of Tollage.			
10.	Ton-mileage ...	49,226	79,516	128,742			Rs. A. P.	
11.	Estimated value of cargo Rs.	1,01,355	54,772	156,127	1. Balance not recovered on the 1st of the month ...		296 10 9	
12.	Number of passengers ...	911	856	1,767	2. Tollage per month ...		1,185 13 6	
13.	Rafts, bamboos C.ft.	.....	3,510	3,510	3. Total ...		1,482 8 3	
14.	Do., timber ..	.....	164	164	4. Amount credited in the accounts of the month ...		1,246 3 6	
15.	Do., bullaha ..	.....	650	650				
16.	Do., firewood ..	.....	51,015	51,015	5. Balance due at the end of the month ...		236 4 9	
17.	Estimated value of rafts Rs.	.....	5,835	5,835				
18.	Tollage on boats ..	273-12-9	370-12-3	644-9-0				
19.	Compounded tollage on boats Rs.	228-0-0	228-0-0	456-0-0				
20.	Tollage on rafts ..	.....	85-4-6	85-4-6				
21.	Total tollage on boats per ton-mile Rs.	.....	.....	0-0-1-64				
22.	Total tollage on rafts per 100 cubic feet Rs.	.....	.....	0-2-5				

BUXAR CANAL SYSTEM.

LENGTH OF CANAL OPEN, 67 MILES.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.		Value.	Quantity.	Value.	
		Up.	Down.	Total.	Tons.	Rs. p. a.	
12	1. Grain ...	66	178	244	15,168	244	15,168
...	2. Cotton ...	2	1	3	4,350	3	4,350
1	3. Oilseeds ...	.....	6	6	400	6	400
...	4. Salt ...	1	.....	1	340	1	340
...	5. Piece-goods ...	1	1	2	2,900	2	2,900
...	6. Metal ...	3	1	4	10,310	4	10,310
1	7. Building materials ...	1	7	8	274	8	274
22	8. Miscellaneous ...	9	191	200	13,968	200	13,968
...	9. Fuel ...	.....	.....	.....	.....	.....	.....
...	10. Timber ...	.....	94	94	1,102	94	1,102
...	11. Bamboos ...	.....	299	299	7,077	299	7,077
86	12. Total ...	83	778	86	55,889	861	55,889
54	13. Total of same month last year.	39	847	886	1,08,234	879	1,07,984
		Up.	Down.	Total.			Rs. p. a.
14.	Total number of boats plying cargo No.	3	33	36	Total tollage of month—24 + 25 + 26 ..		636 4
15.	Total number of boats plying passenger No.	7	9	16			
15½.	Ditto empty ..	25	4	29	Total tollage of same month last year ..		601 13
16.	Total registered tonnage, cargo Tons	104	896	1,000			
17.	Total registered tonnage, passenger Tons	189	206	395			
17½.	Ditto empty ..	115	10	125			
18.	Ton-mileage ...	9,828	9,244	19,072	Memorandum of Tollage.		
19.	Estimated value of cargo Rs.	19,225	28,485	47,710			
20.	Number of passengers ...	460	670	1,130	1. Balance not recovered on the 1st of the month ...		21 9
21.	Rafts, bamboos C. ft.	.....	44,887	44,887	2. Tollage per month ...		636 4
22.	Do., bullocks ..	.....	7,049	7,049	3. Total ..		657 13
23.	Estimated value of rafts Rs.	.....	8,179	8,179	4. Amount credited in the accounts of the month ..		636 1
24.	Tollage on boats ..	82-0-3	135 8-6	217 8 9	5. Balance due at the end of the month ..		1 11
25.	Compounded tollage on boats Rs.	107-0-0	107-0-0	214-0-0			
26.	Tollage on rafts ..	.....	204-11-3	204-11-3			
27.	Total tollage on boats per ton-mile Rs.	.....	.....	0 0-4-34			
28.	Total tollage on rafts per ton on the foot Rs.	.....	.....	0-6-3			

**ABSTRACT FOR THE MONTH OF NOVEMBER 1889 AS COMPARED WITH THE
CORRESPONDING MONTH OF THE PREVIOUS YEAR.**

CANAL.	TRAFFIC, 1889-90.						TRAFFIC, 1888-89.						REMARKS.
	During the month.			To end of the month.			During the month.			To end of the month.			
Orissa Circle.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
Taldunda Canal System ...	55	12	6	2,690	14	7	131	14	0	1,408	0	9	
Kendrapara Canal System	4,784	5	3	30,500	18	7	4,657	12	8	29,426	3	1	
High Level, Range I ...	557	15	4	4,525	0	7	451	1	9	3,824	15	6	
Ditto, " II ...	226	5	9	1,928	7	3	140	12	3	1,605	1	6	
Ditto, " III ...	109	0	9	922	9	3	49	8	6	765	3	6	
Jajopore Canal	15	14	0	66	3	8	9	1	4	48	6	14	
Total Orissa Circle ...	5,749	5	7	40,634	0	11	5,442	2	6	37,077	15	2	
South-Western Circle.													
Midnapore Canal	9,356	8	3	95,279	12	6	10,992	15	9	88,077	7	6	
Hidgellee Tidal Canal ...	2,258	1	9	33,420	11	6	2,529	2	3	42,330	1	6	
Total South-Western Circle	11,614	10	0	1,28,700	8	0	13,522	2	0	1,30,407	9	0	
Sone Circle.													
Patna Canal System	1,131	5	6	16,732	15	0	1,760	2	6	18,449	1	5	
Arrah ditto	1,185	13	6	12,452	15	2	1,502	4	11	13,676	15	5	
Buxar ditto	638	4	0	4,734	0	5	601	13	6	6,256	15	6	
Total Sone Circle ...	2,953	7	0	33,919	14	7	3,864	4	11	37,983	0	5	
GRAND TOTAL ...	20,317	6	7	2,03,254	7	6	22,828	9	5	2,05,468	8	7	

GOVERNMENT TRANSPORT SERVICE.

CANAL.	TRAFFIC, 1889-90.									TRAFFIC, 1888-89.								
	During the month.			To end of the month.			During the month.			To end of the month.			During the month.			To end of the month.		
	Passen- gers.	Goods.	Total receipts.	Passen- gers.	Goods.	Total receipts.	Passen- gers.	Goods.	Total receipts.	Passen- gers.	Goods.	Total receipts.	Passen- gers.	Goods.	Total receipts.	Passen- gers.	Goods.	Total receipts.
<i>Orissa Circle.</i>	No.	Mds.	Rs. A. P.	No.	Mds.	Rs. A. P.	No.	Mds.	Rs. A. P.	No.	Mds.	Rs. A. P.	No.	Mds.	Rs. A. P.	No.	Mds.	Rs. A. P.
High Level ...	700	538	1,940 12 4	4,621	4,806	6,105 10 3	733	694	873 0 10	3,194	1,963	3,601 12 4	733	694	873 0 10	3,194	1,963	3,601 12 4
Total Orissa Circle ...	700	538	1,940 12 4	4,621	4,806	6,105 10 3	733	694	873 0 10	3,194	1,963	3,601 12 4	733	694	873 0 10	3,194	1,963	3,601 12 4

TOTAL NAVIGATION RECEIPTS.

CANAL.	EARNINGS, 1889-90.						EARNINGS, 1888-89.						REMARKS.
	During the month.			To end of the month.			During the month.			To end of the month.			
	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	Rs.	A.	P.	
Orissa Canals	7,690	1	11	46,739	10	14	6,315	3	4	40,679	11	6	
Midnapore Canal	9,356	8	3	95,279	12	6	10,992	15	9	88,077	7	6	
Hidgellee Tidal Canal	2,258	1	9	33,420	11	6	2,529	2	3	42,330	1	6	
Sone Canals	2,953	7	0	33,919	14	7	3,864	4	11	37,983	0	5	
Total	22,258	2	11	2,09,360	1	9	23,701	10	3	2,09,070	4	11	

CALCUTTA.
The 18th February 1890.

G. A. G. SHAW,.
Under-Secy. to the Govt. of Bengal.

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.

SOUTH-WESTERN CIRCLE.

NUDDEA RIVERS.

Statement showing quantities of Goods carried during the month of December 1889.

Number of boats or rafts.	Description.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.		REMARKS.
		Quantity—Tons.		Value.	Quantity.	Value.	
		Up.	Down.	Rupces.	Tons.	Rupces.	
486	1. Grain ...	833-50	3,417-00	4,250-50	2,67,739	4,250-50	2,67,739
...	2. Cotton ...	.....	.....	.....	.....	.....	.....
66	3. Oilseeds ...	5 00	844-50	849-50	94,900	849-50	94,900
318	4. Salt ...	2,921 00	.....	2,521-00	2,49,056	2,921-00	2,49,056
...	5. Piece-goods ...	.....	.....	.....	.....	.....	.....
19	6. Metal ...	119-75	21-00	140-75	71,575	140-75	71,575
21	7. Building materials ...	6 00	39-00	107-00	1,069	107 00	1,069
1,050	8. Miscellaneous ...	2,326-37	7 97-63	10 305-00	17,37,375	10,305-00	17,37,375
74	9. Fuel ...	833-00	133-37	966-37	12,633	966-37	12,633
33 rafts	10. Timber ...	445 c. ft.	10,845 c. ft.	11,290 c. ft.	32,962	11,290-00 c. ft.	32,962
2 "	11. Bamboos ...	10 "	210 "	210 "	17	210-00 "	17
2,034 & 35 rafts.	12. Total ...	{ 7,106-62 & 455 c. ft.	{ 12,433-50 & 11,745 c. ft.	{ 19,540-12 & 11,500 c. ft. }	{ 24,67,326 }	{ 19,540-12 & 11,500 c. ft. }	{ 24,67,326 }
2,113 & 43 rafts	13. Total of same month last year	{ 7,448 & 432 c. ft.	{ 13,138 & 9,141 c. ft.	{ 20,586 & 9,573 c. ft. }	{ 30,42,721 }	{ 20,586 & 9,573 c. ft. }	{ 30,42,721 }
		Up.	Down.	Total.			Rs. A. P.
14. Total number of boats plying cargo No.		906	1,128	2,034	Total tollage of month—24+25+26 ...		11,311 8 0
14a. Ditto empty boats, steamers &c. No.		355	190	545	Total tollage of same month last year ...		11,481 7 0
15. Total number of boats plying passenger No.		488	750	1,238	Memorandum of Tollage.		
15a. Ditto empty boats "		32	28	60			
16. Total registered tonnage, cargo Tons		17,636	26,440	44,076			
17. Total registered tonnage, passenger Tons		241	371	612			
18. Ton-mileage		.....	.....	.....
19. Estimated value of cargo Ra		8,39,765	15,94 582	24,34 347			
20. Number of passengers No.		1,153	1,435	2,588			
21. Rafts, bamboos C. ft.		10	200	210			
22. Do., bullans "		445	10,845	11,290			
23. Estimated value of rafts Ra.		758	32,221	32,979			
24. Tollage on boats "		4,258-10-0	6,849-2-6	11,107-12-6			
25. Compounded tollage on boats Ra.		.....	.....	.....
26. Tollage on rafts "		3-9-0	200-2-6	203-11-6			
27. Total tollage on boats per ton-mile*		.....	.....	.....
28. Ditto on rafts per 100 cubic feet ... Ra.		.....	.....	1-12-4			
					1. Balance not recovered on the 1st of the month ...	Rs. A. P.	368 15 0
					2. Tollage per month ...	11,311 8 0	
					3. Total ...	11,680 7 0	
					4. Amount paid into Treasury during the month ...	11,223 8 6	
					5. Balance due at the end of the month ...	457 1 6	

* Boats in these rivers do not pay per mile.

Abstract for the month of December 1889 as compared with the corresponding month of the previous year.

	1889-90.		1888-89.	
	During the month.	To end of the month.	During the month.	To end of the month.
Tollage	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
...	11,311 8 0	1,57,412 11 9	11,481 7 0	1,65,633 12 8

CALCUTTA,
The 18th February 1890.G. A. G. SHAW,
Under-Secy. to the Govt. of Bengal.

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.

SOUTH-WESTERN CIRCLE.

ORISSA COAST CANAL SYSTEM.

LENGTH OF CANAL OPEN, 97½ MILES.

Statement showing quantities of Goods carried during the month of December 1889.

Number of boats or rafts.	Description.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		Raftage.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.		Tons.	Rupess.	
156	1. Grain ...	1,190	440	1,630	64,422	1,630	64,422	
...	2. Cotton ...	.....	.....	.....	.....	.....	.....
8	3. Oilseeds ...	55	.....	55	4,940	55	4,940	
23	4. Salt ...	.....	209	209	24,525	209	24,525	
6	5. Piece-goods ...	.....	36	36	6,300	36	6,300	
2	6. Metal ...	1	.....	1	115	.....	.....
3	7. Building materials ...	16	5	21	163	15	143	
634	8. Miscellaneous ...	658	511	1,169	1,29,151	1,168	1,29,056	
16	9. Fuel ...	20	91	111	858	93	733	
9 rafts.	10. Timber ...	1,118 c. ft.	.....	1,118 c. ft.	1,094	1,118 c. ft.	1,094	
2 "	11. Bamboos ...	.....	250 c. ft.	250 "	24	250 "	24	
853 }	12. Total ...	{ 1,940 & 1,118 c. ft.	{ 1,292 & 250 c. ft.	{ 3,232 & 1,368 c. ft.	{ 2,31,592	{ 3,206 & 1,368 c. ft.	{ 2,31,237	
11 rafts }								
1,043 }	13. Total of same month last year	{ 2,014 & 303 c. ft.	{ 575 & 43 c. ft.	{ 2,589 & 346 c. ft.	{ 1,61,741	{ 2,589 & 346 c. ft.	{ 1,61,741	
7 }								
		Up.	Down.	Total.			Rs. A. P.	
14.	Total number of boats plying cargo No.	452	401	853	Total tollage of month— 24+25+26 ...		5,404 8 6	
15.	Total number of boats plying passenger No.	71	68	139	Total tollage of same month last year ...		3,876 8 0	
16.	Total registered tonnage, cargo Tons	4,322	3,060	7,982	Memorandum of Tollage.			
17.	Total registered tonnage, passenger Tons	816	788	1,604				
18.	Ton-mileage ...	152,315	151,863	3,04,178				
19.	Estimated value of cargo Ra.	98,773	1,31,701	2,30,474				
20.	Number of passengers No.	1,579	2,024	3,603				
21.	Rafts, bamboos C. ft.	.....	250	250	1. Balance not recovered on the 1st of the month	4,402 10 0		
22.	Do., bullahs "	1,118	.....	1,118	2. Tollage per month ...	5,404 8 6		
23.	Estimated value of rafts Ra.	1,094	24	1,118	3. Total ...	9,807 2 6		
24.	Tollage on boats "	2,690-1-3	2,672-15-3	5,363-0-6	4. Amount paid into Treasury during the month	3,295 9 3		
25.	Compounded tollage on boats Ra.	3-2-0	3-12-0	6-14-0	5. Balance due at the end of the month	6,511 9 3		
26.	Tollage on rafts "	32-12-0	1-14-0	34-10-0				
27.	Total tollage on boats per ton-mile Ra.	.....	.....	0-0-3-3				
28.	Ditto on rafts per 100 cubic feet Ra.	.....	.....	2-8-5				

Abstract for the month of December 1889 as compared with the corresponding month of the previous year.

	1889-90.		1888-89.	
	During the month.	To end of the month.	During the month.	To end of the month.
	Rs. A. P.	Rs. A. P.	Rs. A. P.	Rs. A. P.
Tollage ...	5,404 8 6	43,233 9 0	3,876 8 0	46,019 12 0

CALCUTTA,
The 18th February 1890.G. A. G. SHAWK,
Under-Secy. to the Govt. of Bengal.

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.

SOUTH-WESTERN CIRCLE.

CALCUTTA AND EASTERN CANALS.

Statement showing quantities of Goods carried during the month of December 1889.

Number of boats or rafts.	Description.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		REMARKS.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.	Rupess.	Tons.	Rupess.	
473	1. Grain ...	6,366	.....	6,366	6,21,880	6,366	6,21,880	For details, see next page.
1	2. Cotton ...	1	.....	1	450	1	450	
20	3. Oilseeds ..	330	3	333	37,537	333	37,537	
360	4. Salt ...	436	6,293	6,729	6,35,850	6,729	6,35,850	
.....	5. Piece-goods ...	.....	.....	.....	.....	.....	.....
10	6. Metal ...	10	50	60	13,850	60	13,850	
171	7. Building materials	5,690	91	5,691	88,187	5,691	88,187	
3,690	8. Miscellaneous*...	39,010	2,204	41,214	52,45,120	41,214	52,45,120	
512	9. Fuel ...	9,456	3,910	13,366	1,02,774	13,366	1,02,774	
... ..	10. Timber ...	.....	.....	.....	.....	.....	.....
2 rafts	11. Bamboos ...	64 c. ft	.....	64 c. ft.	10	64 c. ft.	10	
5,237 & 2 rafts.	12. Total ...	{ 61,209 & 64 c. ft.	12,551	73,760 & 64 c. ft.	{ 67,45,658	{ 73,760 & 64 c. ft.	{ 67,45,658	
5,876 & 1 raft.	13. Total of same month last year.	{ 61,033	12,976 & 40 c. ft.	74,009 & 40 c. ft.	{ 62,41,524	{ 74,009 & 40 c. ft.	{ 62,41,524	
		Up.	Down.	Total.				
14. Total number of boats plying cargo No.		4,614	623	5,237	Total tollage of month— 24 + 25 + 26 ...			Rs. A. P. 44,131 13 8
14a. Ditto empty boats "		2,054	1,336	3,390				
15. Total number of boats plying passenger No.		367	8	375	Total tollage of same month last year ...			45,276 6 0
16. Total registered tonnage, cargo Tons		149,965	38,700	168,665	Memorandum of Tollage.			
17. Total registered tonnage, passenger Tons		669	31	700				
18. Ton-mileage ...		1,391,880	387,000	1,778,880				Rs. A. P.
19. Estimated value of cargo Rs.		58,18,485	9,27,163	67,45,648	1. Balance not recovered on the 1st of the month ...			1,295 11 9
20. Number of passengers No.		1,273	39	1,312	2. Tollage per month ...			44,131 13 8
21. Rafts, bamboos C. ft.		64	.....	64				
22. Do., bullahs "		.....	.....	.....	
23. Estimated value of rafts Rs.		10	... ..	10	3. Total ...			45,427 9 0
24. Tollage on boats "		34,641-12-3	9,489-9-0	44,131-5-3				
25. Compounded tollage on boats Rs.		.....	.....	.....	4. Amount paid into Treasury during the month ...			44,299 1 8
26. Tollage on rafts "		0-8-0	.....	0-8-0				
27. Total tollage on boats per ton-mile Rs.		.....	.....	0-0-4-76				
28. Ditto on rafts per 100 cubic feet Rs.		.....	.....	0-12-6	5. Balance due at the end of the month ...			1,126 7 0

ARTICLES OF TRAFFIC INCLUDED IN ITEM 8 (MISCELLANEOUS).
CALCUTTA AND EASTERN CANALS.

Number of Articles.	Description.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		Tons.
		Quantity—Tons.			Value.	Quantity.	Value.	
		Up.	Down.	Total.	Rupess.	Tons.	Rupess.	
558	(a) Jute ...	33,332	77	33,409	42,09,525	33,409	42,09,525	
76	(b) Jaggery ...	548	41	589	57,750	589	57,750	
3	(c) Sugar ...	36	.....	36	9,000	36	9,000	
2	(d) Tobacco ...	.....	8	8	1,575	8	1,575	
230	(e) Fish ...	185	2	187	52,361	187	52,361	
22	(f) Hides ...	28	.....	28	6,388	28	6,388	
50	(g) Poultry ...	5	.....	5	4,892	5	4,892	
87	(h) Hay and straw ...	487	.....	487	11,935	487	11,935	
111	(i) Oil ...	.....	1,769	1,769	2,47,625	1,769	2,47,625	
41	(k) Earthenware ...	90	7	97	1,359	97	1,359	
510	(m) Other miscella- neous ...	4,299	300	4,599	6,43,210	4,599	6,43,210	
900	Total Miscellaneous...	39,010	2,204	41,214	52,45,120	41,214	52,45,120	

PUBLIC WORKS DEPARTMENT, IRRIGATION BRANCH, BENGAL.
SOUTH-WESTERN CIRCLE.
TOLLY'S NULLAH.

Statement showing quantities of Goods carried during the month of December 1889.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.			PRIVATE.	
		Quantity—Tons.		Value.	Quantity.	Value.
		Up.	Down.	Total.	Tons.	Rupess.
5,709	1. Grain ...	11,687	.....	11,687	11,687	10,82,967
15	2. Cotton ...	117	.....	117	117	58,950
11	3. Oilseeds ...	163	.....	163	163	18,650
65	4. Salt ...	541	353	894	894	84,459
.....	5. Piece-goods ...	.....	.....	.....	.....	.....
.....	6. Metal ...	.....	.....	.....	.....	.....
291	7. Building materials ...	2,846	.....	2,846	2,846	14,359
985	8. Miscellaneous ...	5,923	97	6,020	6,020	5,15,068
160	9. Fuel ...	1,943	18	1,961	1,961	15,524
2 rafts	10. Timber ...	7,732 c. ft.	.....	7,732 c. ft.	7,732 c. ft.	19,330
3 "	11. Bamboos ...	213 "	.....	213 "	213 "	35
7,236 & 5 rafts.	12. Total ...	{ 23,220 & 7,945 c. ft.	468	{ 23,688 & 7,945 c. ft.	{ 23,688 & 7,945 c. ft.	{ 18,09,342
6,788 & 3 rafts.	13. Total of same month last year ...	{ 19,296 & 2,150 c. ft.	563	{ 19,859 & 2,150 c. ft.	{ 19,859 & 2,150 c. ft.	{ 14,52,588
14. Total number of boats plying cargo ... No.	7,162	74	7,236	Total tollage of month— 24+25+26		Ra. A. 11,300 0
14a. Ditto empty boats "	1,123	289	1,414	Total tollage of same month last year		11,477 9
15. Total number of boats plying passenger ... No.	398	6	404	<i>Memorandum of Tollage.</i>		
16. Total registered tonnage, cargo ... Tons	64,308	3,633	67,939			
17. Total registered tonnage, passenger ... Tons	850	15	865			
18. Ton-mileage ...	596,365	58,128	654,493	1. Balance not recovered on the 1st of the month		
19. Estimated value of cargo Ra.	17,43,629	46,348	17,89,977	2. Tollage per month		
20. Number of passengers No.	2,411	17	2,428	3. Total		
21. Rafts, bamboos C. ft.	213	.....	213			
22. Do., bullahs "	7,732	.....	7,732			
23. Estimated value of rafts Ra.	19,365	.....	19,365			
24. Tollage on boats "	10,384-15-9	876-12-6	11,261-12-3			
25. Compounded tollage on boats ... Ra.	.....	.....	.....
26. Tollage on rafts "	38-4-0	.....	38-4-0	4. Amount paid into Treasury during the month		
27. Total tollage on boats per ton-mile	.....	.....	0-0-3-30			
28. Ditto on rafts per 100 cubic feet ... Ra.	.....	.....	0-7-8	5. Balance due at the end of the month		

ARTICLES OF TRAFFIC INCLUDED IN ITEM 8 (MISCELLANEOUS).
TOLLY'S NULLAH.

Number of boats or rafts.	DESCRIPTION.	TOTAL GOVERNMENT AND PRIVATE.				PRIVATE.		REMARKS.
		Quantity—Tons			Value.	Quantity.	Value	
		Up.	Down.	Total.	Rupess.	Tons.	Rupess.	
24	(a) Jute ...	186	12	198	24,975	198	24,975	
99	(b) Jaggery ...	618	.....	618	60,602	618	60,602	
1	(c) Sugar ...	...	1	1	180	1	180	
18	(d) Tobacco ...	152	20	172	33,600	172	33,600	
211	(e) Fish ...	16	1	17	4,649	17	4,649	
1	(f) Hides ...	4	.....	4	1,000	4	1,000	
4	(g) Poultry ...	1	.....	1	368	1	368	
266	(h) Hay and straw ...	3,071	.....	3,071	13,086	3,071	13,086	
47	(j) Oil ...	459	5	464	65,000	464	65,000	
102	(k) Earthenware ...	97	3	100	1,398	100	1,398	
212	(m) Other miscellane- ous.	1,319	55	1,374	3,10,210	1,374	3,10,210	
985	Total Miscellaneous...	5,923	97	6,020	5,15,068	6,020	5,15,068	

ABSTRACT FOR THE MONTH OF DECEMBER 1889, AS COMPARED WITH THE
CORRESPONDING MONTH OF THE PREVIOUS YEAR.

	TRAFFIC, 1889-90.				TRAFFIC, 1888-89.			
	During the month.		To end of the month.		During the month.		To end of the month.	
	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.	Rs.	A. P.
Calcutta and Eastern Canals ...	44,131	13 3	2,35,334	1 6	45,276	6 0	2,80,654	3 6
Tolly's Nullah ...	11,300	0 3	67,373	4 9	11,477	9 6	92,840	3 6
Total ...	55,431	13 6	3,02,707	6 3	56,753	15 6	3,73,494	7 0

CALCUTTA,
The 18th February 1890.G. A. G. SHAW, ^W
Under-Secretary to the Govt. of Bengal.

CIRCULAR AND EASTERN CANALS.

Approximate Return of Traffic for the week ending Saturday, the 15th February 1890,
as compared with the corresponding week of the previous year.

NATURE OF CARGO.	WEEK ENDING SATURDAY, THE 15TH FEBRUARY 1890.			WEEK ENDING SATURDAY, THE 16TH FEBRUARY 1889.		
	Number of boats.	Weight of cargo.	Tollage.	Number of boats.	Weight of cargo.	Tollage.
	No.	Mds.	Rs.	No.	Mds.	Rs.
Rice and paddy ...	1,850	8,71,195	6,429	1,556	4,39,270	7,869
Jute ...	199	1,88,325	2,401	133	93,725	1,738
Firewood ...	153	1,04,350	1,468	194	1,25,125	1,851
Other articles ...	1,038	2,47,710	3,689	1,115	2,30,470	3,653
Total ...	2,240	8,58,480	13,957	2,998	8,88,590	15,111

EAST INDIAN RAILWAY.

Statement of Goods Traffic in Staples carried during the five weeks and three days ending 31st December 1889, as compared with the same period of 1888.

		1889.		1888.		Increase.		Decrease.	
STAPLES.		Weight.	Freight.	Weight.	Freight.	Weight.	Freight.	Weight.	Freight.
		Mds.	Rs.	Mds.	Rs.	Mds.	Rs.	Mds.	Rs.
ANIMALS, LIVING	Horses, ponies, and mules	No. 213	8,714	No. 272	18,502	60	10,000	59	9,875
	Cattle	808	1,704	552	1,044	256	660	256	1,276
	Sheep and goats	6,548	8,304	4,207	5,970	2,341	2,334	2,341	2,334
	Other kinds	1,030	1,030	670	248	1,000	782	1,000	782
BIRDS	Canes and rattans	11	10	9	17	2	7	2	7
COTTON, RAW	Catechu (Indian rubber)	22	14	40	60	18	46	18	46
	Chinese and Japanese ware	7,82,277	1,01,726	9,41,847	3,30,000	1,59,570	2,02,274	1,59,570	2,02,274
	Coal and coke, up	20,84,001	3,07,000	35,72,001	1,01,000	14,880,000	5,00,000	14,880,000	5,00,000
	Ditto, down	5,08,077	2,35,000	2,94,000	2,34,000	2,74,077	8,673	2,74,077	8,673
COTTON, MANUFACTURED.	Twist and yarn (European)	11,134	13,000	11,000	15,000	136	1,000	136	1,000
	Ditto (Indian)	17,324	11,400	20,000	13,700	2,676	2,300	2,676	2,300
	Piece-goods (European)	1,02,448	1,73,074	1,00,000	2,10,000	2,556	37,926	2,556	37,926
	Ditto (Indian)	34,119	19,000	34,000	30,000	119	4,000	119	4,000
DRUGS AND MEDICINES.	Assafetida	310	100	1,000	100	690	1,000	690	1,000
	Other sorts, not intoxicating	2,183	2,000	2,000	3,400	1,217	1,400	1,217	1,400
	Intoxicating drugs (other than opium, i.e., arsenic, bhanga, ganja, and charas, &c.)	632	682	771	833	139	151	139	151
	Indigo	85,354	1,05,019	1,08,704	1,55,508	23,350	50,489	23,350	50,489
DYING MATERIALS.	Manila or manila	3	1	24	4	21	3	21	3
	Safflower	87	161	87	121	0	54	0	54
	Turmeric	11,410	6,570	10,000	5,000	1,410	1,570	1,410	1,570
	Other kinds	8,000	1,340	12,500	2,000	4,500	660	4,500	660
EARTHENWARE AND PORCELAIN.	Do., raw	88,000	17,000	1,00,000	28,000	11,200	11,000	11,200	11,000
	Do., manufactured (gunny)	1,01,407	50,000	80,000	45,000	21,407	5,000	21,407	5,000
	Other fibres, raw	43,000	13,000	41,000	10,000	2,000	3,000	2,000	3,000
	Ditto, manufactured	4,000	1,000	3,000	1,000	1,000	0	1,000	0
FRUITS & NUTS.	Coconuts	71,107	82,000	64,000	64,000	7,107	18,000	7,107	18,000
	All other kinds	3,10,000	1,00,000	2,70,000	60,000	40,000	40,000	40,000	40,000
	Wheat	4,00,000	1,00,000	2,00,000	60,000	2,00,000	40,000	2,00,000	40,000
	Gram and pulses	10,00,000	1,00,000	10,00,000	2,00,000	0	0	0	0
GRAIN & PULSES.	Rice, husked	10,00,000	1,00,000	10,00,000	2,00,000	0	0	0	0
	Do., unhusked	1,00,000	1,00,000	1,00,000	1,00,000	0	0	0	0
	Other rain and spring crops	1,00,000	1,00,000	1,00,000	1,00,000	0	0	0	0
	Gums and resins	10,000	1,000	10,000	1,000	0	0	0	0
HIDES & SKINS.	Hides of cattle	10,000	1,000	10,000	1,000	0	0	0	0
	Skins of sheep, goats, and small animals	10,000	1,000	10,000	1,000	0	0	0	0
	Horns	10,000	1,000	10,000	1,000	0	0	0	0
	Lac, dry	10,000	1,000	10,000	1,000	0	0	0	0
LAC.	Do., shell	10,000	1,000	10,000	1,000	0	0	0	0
	Do., stick and other kinds	10,000	1,000	10,000	1,000	0	0	0	0
	Leather, unmanufactured	10,000	1,000	10,000	1,000	0	0	0	0
	Ditto, manufactured	10,000	1,000	10,000	1,000	0	0	0	0
LIQUORS.	Do., dry	10,000	1,000	10,000	1,000	0	0	0	0
	Do., shell	10,000	1,000	10,000	1,000	0	0	0	0
	Do., stick and other kinds	10,000	1,000	10,000	1,000	0	0	0	0
	Leather, unmanufactured	10,000	1,000	10,000	1,000	0	0	0	0
METALS AND MANUFACTURES.	Brass and copper	10,000	1,000	10,000	1,000	0	0	0	0
	Iron	10,000	1,000	10,000	1,000	0	0	0	0
	Other metals	10,000	1,000	10,000	1,000	0	0	0	0
	Opium	10,000	1,000	10,000	1,000	0	0	0	0
PAINTS AND COLOURS.	Do., dry	10,000	1,000	10,000	1,000	0	0	0	0
	Do., shell	10,000	1,000	10,000	1,000	0	0	0	0
	Do., stick and other kinds	10,000	1,000	10,000	1,000	0	0	0	0
	Leather, unmanufactured	10,000	1,000	10,000	1,000	0	0	0	0
PROVISIONS.	Ghee	10,000	1,000	10,000	1,000	0	0	0	0
	Other kinds	10,000	1,000	10,000	1,000	0	0	0	0
	Railway materials	10,000	1,000	10,000	1,000	0	0	0	0
	Ditto ditto	10,000	1,000	10,000	1,000	0	0	0	0
SALT.	Salt	10,000	1,000	10,000	1,000	0	0	0	0
	Salt-petre	10,000	1,000	10,000	1,000	0	0	0	0
	Other saline substances	10,000	1,000	10,000	1,000	0	0	0	0
	Mustard and rape	10,000	1,000	10,000	1,000	0	0	0	0
SEEDS.	Til or sesamli	10,000	1,000	10,000	1,000	0	0	0	0
	Other oilseeds	10,000	1,000	10,000	1,000	0	0	0	0
	Oilseed	10,000	1,000	10,000	1,000	0	0	0	0
	Tea seed	10,000	1,000	10,000	1,000	0	0	0	0
OTHER SEEDS.	Do., dry	10,000	1,000	10,000	1,000	0	0	0	0
	Do., shell	10,000	1,000	10,000	1,000	0	0	0	0
	Do., stick and other kinds	10,000	1,000	10,000	1,000	0	0	0	0
	Do., raw	10,000	1,000	10,000	1,000	0	0	0	0
SKIN.	Do., manufactured (European)	10,000	1,000	10,000	1,000	0	0	0	0
	Ditto (Indian)	10,000	1,000	10,000	1,000	0	0	0	0
	Spices	10,000	1,000	10,000	1,000	0	0	0	0
	Stone and marble	10,000	1,000	10,000	1,000	0	0	0	0
STARCH.	Sugar, refined	10,000	1,000	10,000	1,000	0	0	0	0
	Do., unrefined	10,000	1,000	10,000	1,000	0	0	0	0
	Tea, Indian	10,000	1,000	10,000	1,000	0	0	0	0
	Do., foreign	10,000	1,000	10,000	1,000	0	0	0	0
TOBACCO.	Timber	10,000	1,000	10,000	1,000	0	0	0	0
	Firewood	10,000	1,000	10,000	1,000	0	0	0	0
	Do., raw	10,000	1,000	10,000	1,000	0	0	0	0
	Ditto, manufactured (European)	10,000	1,000	10,000	1,000	0	0	0	0
WOOL.	Wool, manufactured (Indian)	10,000	1,000	10,000	1,000	0	0	0	0
	Staples	10,000	1,000	10,000	1,000	0	0	0	0
	All other articles of merchandise	10,000	1,000	10,000	1,000	0	0	0	0
	Monies	10,000	1,000	10,000	1,000	0	0	0	0
GOVERNMENT STORES.	Monies	10,000	1,000	10,000	1,000	0	0	0	0
	Monies	10,000	1,000	10,000	1,000	0	0	0	0
	Monies	10,000	1,000	10,000	1,000	0	0	0	0
	Monies	10,000	1,000	10,000	1,000	0	0	0	0
Total		1,00,00,000	1,00,00,000	1,00,00,000	1,00,00,000	0	0	0	0

Minerals.—Principally in kunkur from Rajbandh to Burdwan and other stations, and in lime from Ransegunge to the jetties for the Kidderpore Docks.

Brass and copper.—The increase was chiefly in the unmanufactured articles from Howrah, owing to cheaper prices than in 1888.

Iron.—The increase was principally due to the carriage at a specially reduced rate of a large quantity of old iron rails sold for delivery in Howrah, and also to increased despatches from Howrah to Agra and Allahabad for the new Water Works.

Oil.—This increase was entirely in kerosine oil from Howrah.

Opium.—Due to despatches of opium from the Government factories having been kept back during the previous month owing to unsettled weather.

Ghee.—Principally in despatches from stations in the North-Western Provinces to Howrah.

Salt.—The principal fluctuations were in country salt crossing this Railway at Cawnpore, Agra, and Delhi.

Stones.—Principally in short distance despatches from Asansol, Durgapur, Pakur, Budhachal, Agra.

Sugar and jaggree.—Chiefly in despatches from stations on the Gya line.

Timber.—Principally in sleepers from Howrah to Mokameh.

Bones.—Principally in bones from stations in the North-Western Provinces to Bally for the crushing mills.

Potatoes.—The increase was chiefly in hill potatoes from the R-hilkhand-Kumaon Railway, and in despatches from Dinapore and Digha Ghat.

Wheat.—Due to a slight demand for export to Europe during the early part of the month.

Grain and pulses.—The increase was due to considerable despatches from stations on the loop line and on the Dinapore district; also from the Oudh and Rohilkhand Railway via Mogul Serai; and from stations between Allahabad and Agra to Howrah and Bombay.

Other rain and spring crops.—Due partly to a good demand in Calcutta supplied from stations on the Dinapore district and the Oudh and Rohilkhand Railway; but the principal increase was in despatches from Cawnpore and Mankar to Agra for local consumption.

DECREASES.

Coal and coke.—There was a decrease both in the upward and downward despatches. In downwards traffic the decrease was principally in coal for export.

Horses.—Due to an exceptional horse traffic having been carried last year.

Pisco-goods.—The decrease was principally in despatches from Howrah to Cawnpore, Delhi, and other stations in the North-Western Provinces and the Punjab.

Indigo.—The decline follows a large increase in November 1889.

Jute.—The decrease was principally from the Purneah district via Sahebganje owing to poor crops.

Hides.—Supplies are reported to be scarce, and there is little demand from Europe.

Lac.—The traffic in shell and stick lac has shown a decline throughout the half year.

Railway material, Foreign.—Due to limited despatches for the Hengal-Nagpore and Delhi-Umballa-Kalka Railways.

Salt-petre.—The falling off was in despatches from the Tirhoot State Railway.

Seeds.—The decrease was entirely in linseed owing to exhaustion of stocks.

Rice (husked and unhusked).—There was an increase in the weight carried attended with a decrease in the freight earned, and this was due to short land traffic.

N. ST. L. CARTER, Traffic Manager.

TRAFFIC MANAGER'S OFFICE, CALCUTTA, 12th February 1890.

Weekly Return of Traffic Receipts on Indian Railways.

EAST INDIAN RAILWAY.

Approximate Return of Traffic for week ended 8th February 1890, on 1,525½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other articles (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	MDS. B.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ...	208,043	8,61,366 3 0	29,65,351 0	8,30,700 2 6	20,20 15 0	9,32,328 3 6	86,100	9,401	161,501
Or per mile of railway ...	136	5 10	19 5	5 4	13 4 6	6 14 4	...	...	...
For previous 6 weeks of half-year ...	1,200,108	13,76,340 4 0	1,10,55,088 20	26,65,092 14 0	91,401 14 0	41,21,785 0 6	301,658	415,376	716,234
Total for 6 weeks ...	1,408,051	16,67,780 6 0	1,40,01,040 20	32,94,083 1 0	1,11,723 13 0	50,74,123 4 0	387,858	508,953	896,811
COMPARISON.									
Total for corresponding week of previous year ...	277,103	8,17,07 15 4	29,63,018 0	8,03,020 15 0	15,810 7 3	9,36,451 0 1	88,771	97,633	166,404
Per mile of railway corresponding week of previous year ...	...	5 10	...	5 4	10 6 3	6 13 10	...	...	...
Total to corresponding date of previous year ...	1,437,207	16,94,644 13 8	1,62,45,787 37	35,65,000 7 3	86,910 0 5	53,37,903 5 1	370,803	509,000	879,803

Approximate Statement of gross receipts of the East Indian Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 8TH FEBRUARY 1890			RECEIPTS FOR WEEK ENDING 8TH FEBRUARY 1889			TOTAL RECEIPTS FROM 1ST APRIL 1888 TO 8TH FEBRUARY 1890			TOTAL RECEIPTS FROM 1ST APRIL 1888 TO 8TH FEBRUARY 1889			Total increase in 1890.	Total decrease in 1889.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Rs.	Rs.
Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.			
1,525½	9,56,461	6 14	1,525½	9,45,328	6 14	1,525½	3,78,70,988	248	1,525½	3,76,35,100	248	...	2,41,706

PATNA-GYA STATE RAILWAY.

Approximate Return of Traffic for week ended 8th February 1890, on 57½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
Total traffic for the week ...	12,041	Rs. A. P. 6,943 2 0	Mds. S. 57,441 30	Rs. A. P. 2,391 14 0	Rs. A. P. 52 0 0	Rs. A. P. 9,487 0 0	1,697	603	2,300
Or per mile of railway ...	211	132 1 4	602 0	41 13 1	0 16 6	164 12 11	.....	.....	.....
For previous 5 weeks of half-year ...	59,120	30,544 6 0	1,01,080 20	10,933 11 0	232 8 0	41,750 0 0	8,061	3,440	11,501
Total for 6 weeks ...	71,161	37,547 8 0	1,58,523 10	13,325 0 0	284 8 0	51,177 0 0	9,768	4,052	13,820
COMPARISON.									
Total for corresponding week of previous year ...	12,435½	6,591 1 6	22,192 10	1,634 8 0	39 5 3	8,265 14 9	1,031	463	2,304
Per mile of railway corresponding week of previous year ...	218	110 3 6	288 0	28 9 2	0 11 0	144 7 10	.....	.....	.....
Total to corresponding date of previous year ...	70,202	37,134 8 6	1,77,389 20	10,176 4 0	260 6 9	47,631 0 3	11,018	5,000	16,208

Approximate Statement of gross receipts of the Patna-Gya State Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 9th FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 8th FEBRUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 8th FEBRUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 8th FEBRUARY 1890.			Total increase in 1890.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
57½	Rs. 6,265	Rs. 144	57½	Rs. 9,427	Rs. 163	57½	Rs. 4,16,299	Rs. 162	57½	Rs. 4,33,699	Rs. 165	Rs. 17,390	Rs.

TARKESSUR BRANCH RAILWAY.

Approximate Return of Traffic for week ended 8th February 1890, on 22½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
Total traffic for the week ...	24,561	Rs. A. P. 5,274 6 0	Mds. S. 19,664 20	Rs. A. P. 563 0 0	Rs. A. P. 7 11 0	Rs. A. P. 5,845 1 0	890	78	968
Or per mile of railway ...	.....	237 0 10	.....	25 4 10	0 5 6	262 11 2	.....	.....	.....
For previous 5 weeks of half-year ...	86,641	22,305 1 0	53,463 20	2,096 8 0	23 15 0	24,345 8 0	4,119	310	4,429
Total for 6 weeks ...	111,202	27,579 7 0	73,128 0	2,699 8 0	41 10 0	30,190 9 0	5,000	397	5,397
COMPARISON.									
Total for corresponding week of previous year ...	26,745	6,419 6 9	7,878 30	570 11 0	10 12 0	6,700 7 9	925	48	973
Per mile of railway corresponding week of previous year ...	.....	245 8 10	.....	12 2 8	0 7 9	256 8 3	.....	.....	.....
Total to corresponding date of previous year ...	111,516	28,215 2 4	85,570 10	1,521 1 0	41 15 9	30,076 8 1	5,109	368	5,477

Approximate Statement of gross receipts of the Tarkessur Branch Railway, prepared in accordance with Public Works Department Circular No. XXI, Railway, dated 23rd July 1883.

RECEIPTS FOR WEEK ENDING 9th FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 8th FEBRUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 8th FEBRUARY 1890.			TOTAL RECEIPTS FROM 1st APRIL 1889 TO 8th FEBRUARY 1890.			Total increase in 1890.	Total decrease in 1890.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
22½	Rs. 5,700	Rs. 256	22½	Rs. 5,845	Rs. 263	22½	Rs. 2,36,954	Rs. 237	22½	Rs. 2,34,187	Rs. 234	Rs.	Rs. 2,771

EASTERN BENGAL STATE RAILWAY.

(INCLUDING N. B., DACCA, K. AND D., AND ASSAM-BENGAL SECTIONS.)

Approximate Return of Traffic for week ended 1st February 1890, on 747 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated), including steam-treat.	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week...	167,780	80,870 0 0	6,83,700 0	1,29,910 0 0	26,870 0 0	2,37,430 0 0	22,861	22,487	45,348
Or per mile of railway...	198	108 0 0	915 0	174 0 0	13 0 0	296 0 0			
For previous 4 weeks of half-year...	558,810	2,74,780 0 0	23,12,390 0	5,37,800 0 0	57,180 0 0	8,69,060 0 0	82,143	132,119	214,262
Total for 5 weeks...	726,590	3,55,650 0 0	29,94,680 0	6,67,710 0 0	84,050 0 0	11,06,490 0 0	165,124	154,606	319,730
COMPARISON.									
Total for corresponding week of previous year...	129,664	79,323 0 0	8,40,724 0	87,188 0 0	25,200 0 0	1,91,803 0 0	22,845	24,436	47,281
Per mile of railway corresponding period of previous year...	163	118 0 0	883 0	130 0 0	12 0 0	256 0 0			
Total to corresponding date of previous year...	654,780	3,36,344 0 0	24,36,800 0	5,23,488 0 0	78,157 0 0	9,20,008 0 0	103,018	126,537	229,555

* Excluding steamer earnings.

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Eastern Bengal State Railway.

RECEIPTS FOR WEEK ENDING 2ND FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 2ND FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 1ST FEBRUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Rs.	Rs.
673	Rs. 1,91,803	284	747	Rs. 2,37,430	318	673	Rs. 91,81,396	310	725	Rs. 97,32,715	305	Rs. 5,81,317	Rs.

* Audited up to week ending 14th December 1889.

BENGAL CENTRAL RAILWAY.

Approximate Return of Traffic for week ended 1st February 1890, on 125 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week...	24,540	11,680 0 0	53,140 0	2,810 0 0	90 0 0	14,770 0 0	2,736	1,936	4,672
Or per mile of railway...	196	94 0 0	425 0	23 0 0	1 0 0	118 0 0			
For previous 4 weeks of half-year...	86,490	27,000 0 0	1,44,100 0	9,470 0 0	270 0 0	46,830 0 0	13,743	6,916	20,659
Total for 5 weeks...	123,330	48,680 0 0	2,91,240 0	12,300 0 0	360 0 0	61,660 0 0	17,078	8,852	25,930
COMPARISON.									
Total for corresponding week of previous year...	24,064	9,115 0 0	55,683 0	2,464 0 0	70 0 0	11,643 0 0	2,739	1,943	4,682
Or per mile of railway corresponding period of previous year...	190	73 0 0	444 0	19 0 0	1 0 0	93 0 0			
Total to corresponding date of previous year...	123,994	44,008 0 0	2,30,033 0	10,608 0 0	2,675 0 0	56,318 0 0	17,633	9,130	26,763

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Bengal Central Railway.

RECEIPTS FOR WEEK ENDING 2ND FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 2ND FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 1ST FEBRUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Rs.	Rs.
125	Rs. 11,643	93	125	Rs. 14,770	118	125	Rs. 4,04,006	110	125	Rs. 4,51,796	116	Rs. 27,391	Rs.

* Audited up to week ending 14th December 1889.

DACCA STATE RAILWAY.

Approximate Return of Traffic for week ended 1st February 1890, on 86 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	10,930	8,490 0 0	50,950 0	2,570 0 0	250 0 0	8,610 0 0	2,492	622	3,104
Or per mile of railway	197	94 0 0	830 0	31 0 0	3 0 0	100 0 0	.....	.....	.....
For previous 4 weeks of half-year	61,309	22,880 0 0	1,31,100 0	13,470 0 0	700 0 0	37,050 0 0	8,854	2,408	12,352
Total for 5 weeks	72,239	28,370 0 0	1,61,050 0	16,040 0 0	950 0 0	45,660 0 0	11,336	4,120	15,456
COMPARISON.									
Total for corresponding period of previous year	16,745	4,778 0 0	15,607 0	1,515 0 0	257 0 0	6,550 0 0	2,482	622	3,104
Per mile of railway corresponding period of previous year	195	55 0 0	181 0	18 0 0	3 0 0	76 0 0	.....	.....	.....
Total to corresponding date of previous year	73,704	22,102 0 0	50,642 0	6,330 0 0	680 0 0	29,118 0 0	11,727	2,989	14,606

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Dacca State Railway.

RECEIPTS FOR WEEK ENDING 2ND FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 1ST FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 2ND FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 1ST FEBRUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
86	6,350	76	86	8,610	100	80	1,62,502	67	86	3,30,032	87	77,900	.....

* Audited up to week ending 10th December 1889.

NALHATI STATE RAILWAY.

Approximate Return of Traffic for the week ending 8th February 1890, on 27½ miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN.		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. c.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week	3,760	1,132 0 0	10,972 0	641 0 0	15 0 0	1,788 0 0	509	354	763
Or per mile of railway	153	43 0 0	401 0	23 0 0	1 0 0	66 0 0	.....	.....	.....
For previous 4 weeks of half-year	13,804	4,838 0 0	65,437 0	4,874 0 0	68 0 0	8,940 0 0	2,327	1,161	3,488
Total for 5 weeks	17,164	6,071 0 0	76,409 0	4,977 0 0	83 0 0	10,728 0 0	2,836	1,415	4,251
COMPARISON.									
Total for corresponding week of previous year	3,400	1,431 0 0	18,165 0	1,035 0 0	12 0 0	2,478 0 0	809	638	1,446
Per mile of railway corresponding week of previous year	125	53 0 0	666 0	38 0 0	.....	91 0 0	.....	.....	.....
Total to corresponding date of previous year	18,354	6,913 0 0	92,864 0	4,917 0 0	97 0 0	11,927 0 0	2,908	3,274	6,182

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Nalhati State Railway.

RECEIPTS FOR WEEK ENDING 9TH FEBRUARY 1889.			RECEIPTS FOR WEEK ENDING 8TH FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 9TH FEBRUARY 1890.			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 8TH FEBRUARY 1890.			Total increase in 1889-90.	Total decrease in 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.		
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
27½	2,678	91	27½	1,788	66	27½	87,164	74	27½	88,136	74	.....	638

TIRHOOT STATE RAILWAY.

Approximate Return of Traffic for the week ending 8th February 1890, on 273 miles open.

	COACHING TRAFFIC.		MERCHANDISE AND MINERAL TRAFFIC.		Other earnings (estimated).	Total earnings.	TRAFFIC TRAIN-MILES RUN		
	Number of passengers.	Coaching receipts.	Weight carried.	Receipts.			Coaching.	Merchandise.	Total.
		Rs. A. P.	Mds. S.	Rs. A. P.	Rs. A. P.	Rs. A. P.			
Total traffic for the week ...	77,561	220,163 0 0	5,41,587 0	28,645 0 0	4,809 0 0	69,760 0 0	7,302	8,328	15,630
Or per mile of railway ...	284	133 0 0	885 0	105 0 0	3 0 0	241 0 0*			
For previous 4 weeks of half-year ...	206,211	91,397 0 0	11,70,630 0	1,26,813 0 0	25,678 0 0	2,41,768 0 0	24,066	39,760	63,826
Total for 4 weeks ...	283,762	127,660 0 0	13,72,237 0	1,55,428 0 0	28,470 0 0	3,11,404 0 0	32,868	48,078	80,946
COMPARISON.									
Total for corresponding week of previous year ...	40,973	16,777 0 0	1,51,932 0	14,301 0 0	3,319 0 0	34,427 0 0	5,973	8,497	14,470
Per mile of railway corresponding week of previous year ...	180	6 0 0	657 0	51 0 0	1 0 0	115 0 0*			
Total in corresponding date of previous year ...	216,457	81,718 0 0	7,81,278 0	72,173 0 0	17,720 0 0	1,71,011 0 0	31,906	31,308	63,214

* Steam-boat earnings excluded in calculating "Total earnings per mile of Railway."
 * Increase is due to Magt Purnamashi Mds.

FINANCIAL YEAR.

Approximate Statement of gross receipts of the Tirhoot State Railway.

RECEIPTS FOR WEEK ENDING 8TH FEBRUARY 1889			RECEIPTS FOR WEEK ENDING 8TH FEBRUARY 1890			TOTAL RECEIPTS FROM 1ST APRIL 1888 TO 8TH FEBRUARY 1889			TOTAL RECEIPTS FROM 1ST APRIL 1889 TO 8TH FEBRUARY 1890			Total increase to 1889-90.	Total decrease to 1889-90.
Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Receipts.	Per mile worked.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Mean mileage worked.	Total receipts.	Per mile worked per week.	Rs.	Rs.
	Rs.	Rs.		Rs.	Rs.		Rs.	Rs.		Rs.	Rs.	Rs.	Rs.
273	34,467	126	273	69,760	255	204,87	14,21,114	125	273	17,08,400	123	3,77,318	.....



SUPPLEMENT TO The Calcutta Gazette.

WEDNESDAY, FEBRUARY 26, 1890.

OFFICIAL PAPERS.

Non-Subscribers to the GAZETTE may receive the SUPPLEMENT separately on payment of Six Rupees per annum if delivered in Calcutta, or Twelve Rupees if sent by Post.

CONTENTS.

Page.	Page.
ABSTRACT of the Proceedings of the Council of the Lieutenant-Governor of Bengal, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 and 25 Vic., Cap. 67	451
Rainfall, Weather, and State and Prospects of the Crops	474
Prices-current (retail) of Food-stuffs, Firewood and Salt in the Head-quarter Station Hazara of the districts of Bengal on the 15th February 1890	475
Meteorological Report of the Province of Bengal for the week ending Friday the 21st of February 1890	484
Statement of Rainfall in Bengal for the week ending Friday (5 a.m.), the 21st of February 1890	485
RESULTS of the Barometrical and Thermometrical Observations taken at the Meteorological Office, Chowringhee, from 16th to 22nd February 1890	490
Results of the Meteorological Observations taken at the Almora Observatory from 16th to 22nd February 1890	491
Statement showing the Results of the Registration of Births and Deaths in the Principal Municipalities in Bengal during the week ending 5th February 1890	492
Circular and Eastern Canals for the week ending 22nd February 1890	495
Eastern Bengal State Railway for the month of November 1889	495
Bengal Central Railway for the month of November 1889	496
Nalhati State Railway for the month of January 1890	497
Weekly Return of Traffic Receipts on Indian Railways	498

Abstract of the Proceedings of the Council of the Lieutenant-Governor of Bengal, assembled for the purpose of making Laws and Regulations under the provisions of the Act of Parliament 24 and 25 Vic., Cap. 67.

The Council met at the Council Chamber on Saturday, the 15th February, 1890.

Present:

The HON'BLE SIR STEUART COLVIN BAYLEY, K.C.S.I., C.I.E., Lieutenant-Governor of Bengal, *presiding*.

The HON'BLE SIR CHARLES PAUL, K.C.I.E., *Advocate-General*.

The HON'BLE F. B. PEACOCK.

The HON'BLE P. NOLAN.

The HON'BLE T. T. ALLEN.

The HON'BLE SIR HENRY HARRISON, K.T.

The HON'BLE SIR ALFRED CROFT, K.C.I.E.

The HON'BLE C. H. MOORE.

The HON'BLE H. PRATT.

The HON'BLE SHAHZADA MAHOMMED FURROKH SHAH.

The HON'BLE DR. RASH BEHARY GHOSE.

The HON'BLE RAJA RAMESHWAR SING BAHADUR.

CALCUTTA PORT BILL.

The Hon'ble Sir Henry Harrison moved that the Report of the Select Committee on the Bill to consolidate and amend the law relating to the Port of Calcutta, and to the appointment of Commissioners for the said Port, be taken into consideration in order to the settlement of the clauses of the Bill.

The Motion was put and agreed to.

The Hon'ble Sir Henry Harrison also moved that the clauses of the Bill be considered for settlement in the form recommended by the Select Committee.

He said:—"I think the Select Committee may fairly claim to be satisfied with the work which they have put before the Council. It is perfectly clear that in regard to one section, eighty-five, and other matters cognate thereto, we have been confronted with very great difficulties which, I am free to admit that though we have tried our best to surmount, still remain for discussion. But putting that section aside, and the questions arising out of it, and looking to the fact that no other amendments are proposed except in regard to that matter, I think we may claim to have settled the Bill in a manner satisfactory to all parties.

"There were several other controversial questions: for instance, the question of the number of Commissioners, in regard to which the Bill can only be said not to have given general satisfaction, because the National Chamber of Commerce have expressed their dissatisfaction; but upon that point the Lieutenant-Governor gave a hearing to the representatives of that Chamber, and at the end, I think, they also were satisfied. Anyhow, it seems that no member of the Council has moved an amendment on that section. The number of members asked for has been given to the Bengal Chamber of Commerce. And, as regards the number of native Commissioners, we think it better to trust to the probability that two of the members who will be returned by the elective bodies themselves will be natives, than to say that two of the elected Commissioners must be natives. Your Honour yourself has pointed out that to the Bengal Government are allotted only five members, whereas it may be said that six interests, including the Chairman of the Municipality, require representation. As regards the Municipality, I think it is clear from our proceedings that we do not suggest any guarantee that the Chairman shall be nominated; and I may say that this is one of the six interests for which there are five vacancies—but what the Select Committee have considered, and what the Government, I believe, have accepted, is that, if the Chairman is to be a member then he can be nominated. Anyhow, it is intended that the Municipal Commissioners ought to have the right of free election without having to consider that, if they do not elect their Chairman he cannot be a member of the Port Commission.

"Then, as regards the questions as to the control of the Government over the budget and over rules to be passed by the Port Commissioners and other matters, we have settled them in a way which, from the absence of any amendment, seems to have given satisfaction to all parties.

"Lastly, as to the important question of the equitable assessment of the Port Trust property, we have introduced a new assessment section which appears to give satisfaction on the one hand to the Port Trust, and on the other hand to the Municipality and the Local Government. Your Honour appears to be satisfied with the duty imposed on the Government of mediating in the matter should it appear necessary.

"As regards the one debatable section, its details will be discussed when the amendment comes before the Council. All I wish to say now generally is, that I think the Hon'ble Mr. Moore will admit that from the first the Council has endeavoured to meet the question in a conciliatory manner, and that the impression that there was an endeavour to harden the law or to make the law more drastic, is without foundation. From the very first we introduced some modification in the former section by giving the Local Government the power of awarding compensation when they are satisfied it should be given; but it appears that the persons who are interested do not consider that an executive guarantee of that kind is satisfactory. They consider that they are entitled to some legal guarantee, and therefore in that form the section is no longer before the Council, but has been modified. Still I may fairly claim to say that from

the first the Select Committee, wherever they have touched questions of this kind at all, have always touched them in the way of softening rather than of hardening previous laws.

"It may be objected that the section was so worded as to have retrospective effect; but the old section required to be re-introduced with retrospective effect, because it has been in force for the last twenty years: and when we found there must be a discussion on it, we placed it in the more simple form of giving it retrospective effect instead of giving it effect from 1870. If the solution of giving it effect from 1870 had been considered satisfactory, no doubt the Select Committee would readily have compromised upon that basis. The only reason why it was put in the simpler form was, that the principle might come before the Council in the widest possible form; as they understood from the Hon'ble Mr. Moore that it would be contested. Otherwise no one would have objected to alter in such a way as not to take away any rights which the previous law had not taken away."

The Motion was put and agreed to.

The Hon'ble Mr. MOORE moved that the following clause be added to section 2 of the Bill:—

'Nothing herein contained shall deprive any person of any right of property or other private right except as hereinafter expressly provided.'

He said:—"I have not come here with any long-set speech on this subject. All I wish to do is to capture your votes, and the less I trouble you the more chance I shall have of succeeding."

[The Hon'ble SIR HENRY HARRISON interrupting, asked whether it was more convenient that the discussion should take place over the present amendment or over the next: he was willing to accept this amendment?]

The Motion was put and agreed to.

The Hon'ble Mr. MOORE also moved that, for section 85 of the Bill, the following be substituted:—

'85. In case any wharf, quay, stage, jetty, pier, erection or mooring may have been or hereafter shall be, made, erected, or fixed within or without high-water-mark without the limits of the port, and thereafter the limits for the time being of the port shall be extended so as to include the place on which such wharf, quay, stage, jetty, pier, erection or mooring shall have been made, erected, or fixed, it shall be lawful for the Commissioners, when the safety of navigation or the improvement, maintenance, or good government of the port so requires, to remove, fill up, or destroy such wharf, quay, stage, jetty, pier, erection or mooring:

Provided that when any such work has, under this section, been so dealt with, the Commissioners shall, when such work was made on behalf of the public for the convenience of public traffic, make or provide for the use of the public such sufficient wharves, quays, stages, jetties, piers, erections or moorings as the Local Government may direct, and shall, when such work was made by any private person for the convenience of private traffic—

- (a) on land belonging to the Government, with the previous consent of the Local Government in writing, or of which the making, erecting, or fixing has been subsequently sanctioned by the Local Government in writing; or
- (b) on land belonging to the private owner, whether acquired by grant from the Government, or by prescriptive right, or otherwise,

make compensation therefor to the owners thereof to such an amount as may be determined by agreement by and between the Commissioners and such owners, or by the Civil Court in which a suit may be brought to establish and enforce such right of compensation.'

He said:—"I presume, I may hope, you have all read the memorial of the Chamber of Commerce, because that memorial, coupled with the dissent I previously recorded, I put in, so to speak, as my case. I wish at the outset to state that every legal allusion, historical and otherwise, in that memorial was submitted, approved, and settled by Mr. Woodroffe, the Counsel consulted by the Chamber. I specially mention this, because I have heard it has been concluded that Mr. Woodroffe did not approve the arguments set out in the first two pages of the memorial, because in the opinions quoted in the annexures he did not specially allude to them. That is easy of explanation. The opinions merely replied to specific points put to him, which did not happen to include those arguments the drift of which, I think, the Council understands.

"Briefly it is this: I maintain that this Bill as drafted discards the principle existing in the governing Ports Bill of the Supreme Government that, certain private property cannot be included within the limits of a port, and that every sense of reason and justice demands that this Bill should be brought into conformity with that principle, that is to say, with the Bill of the Supreme Government. If it is not so, it gives rise to great anomalies, as it makes the tenure of property on foreshores ruled by the Port Act totally different to that ruled by the substantive law of the land; and as no limit is ascribed to the distance to which the port may be extended, no holder of such property is secure in the understanding of his liabilities and obligations, as at any time a stroke of the pen may entirely change them. The Port Law may with the port go up to Chinsurah or Hooghly, or down to Diamond Harbour, or anywhere, and surely the perpetuation of such a state of affairs is neither sound nor just legislation.

"The section which I move indicates the principle I fight for, as well the further essential and equally sound doctrine that, when private property and rights have to be acquired for the public good,—the power to acquire which, I do not contest, must under proper conditions exist—complete compensation must be given for what is taken away, and confiscation without compensation must under no kind of circumstances be legalised.

"That was the principle enunciated by the Supreme Government when it re-enacted their Ports Bill in 1875, and it was deliberately enunciated because the true interpretation of the Act of 1855 on this point had been misunderstood in the administration of the Bengal Act V of 1870, which is shown in the remark of Mr. Hobhouse at the time, that the literal construction of the section (*i.e.*, the section in the Act of 1855 to which all my remarks refer) could not have been intended (that is to say, the construction that a private wharf could be included within the limits of the port) taken in connection with the fact that on literal construction the Port Commissioners had under Act VII of 1870 acted in regard to a private wharf, the owners of which drew the attention of Mr. Hobhouse to the circumstance, with the result that he spoke as quoted and introduced the change named.

"Now that we are re-enacting our Act passed five years before this change in the Government of India Bill, it behoves us to follow the same lines, and correct our Bill as the Supreme Government corrected theirs which governs ours. Towards this result I ask for your votes for my motion; and have only further to point out that this Bill is to rule the Port Commissioners, who are the guardians of the trade of the port, which is represented by the traders whom I represent in this Council. There is no antagonism of thought on this point between traders and their guardians; and as the representative of the traders, I say we are strongly in favour of the principle that, private property and rights within or without the port must be respected, and when acquired for public good must be paid for; that we are the people who have to pay, and being willing and desirous of paying what is equitable and proper, we press that legislation which is for us should be on these lines.

"I cannot find one dissentient voice to what I urge outside the walls of this Council; and to the best of my belief, therefore, if this motion is lost, the only opponents to it connected with the port of Calcutta will be the majority which reject it, who will by such rejection, to the best of my belief, be denying that the administration of the port should in any way recognise that private property and rights exist."

The Hon'ble SIR HENRY HARRISON said :—"It will probably be most convenient if, simultaneously with the amendment moved by the Hon'ble Mr. Moore, I move the amendment which stands in my name, as it covers the same ground. On this point, I think, I labour under a certain disadvantage, because the Hon'ble Mr. Moore has not made any allusion to this amendment; he has not stated in what respects it falls short of what he thinks right and proper. This I find a great difficulty, because the clause which I propose has been carefully worded to meet the very principles for which the hon'ble member contends."

The Hon'ble MR. MOORE continued :—"I was not aware I could allude to another amendment in discussing this. My main objections are in the third

opinion of Mr. Woodroffe, who points out the thick veil of ambiguity in which the context of the word 'lawfully' is concealed, and what it here means and implies. That in the sanction to be given by the Local Government to destruction of a jetty, it is not laid down that the party interested is to receive previous notice of the intention of the Port Commissioners, and such sanction might be applied for and given as a matter of routine by an Under-Secretary without the person interested knowing anything of it, until the notification dooming his property was pasted upon it. That my section more clearly defines the exact circumstances under which compensation is due and must be paid, and it sets out the principles which justifies private property being touched, namely, when necessary for the safety of navigation or good government of the port; whereas under the Hon'ble Sir Henry Harrison's section, power of seizure is given without naming any reason for it at all."

The Hon'ble Sir HENRY HARRISON then moved by way of amendment that, for section 85 of the Bill, the following be substituted:—

'In case any wharf, quay, stage, jetty, pier, erection or mooring may have been, or shall hereafter be, made, erected, or fixed below high water-mark without the limits for the time being of the port, and thereafter the limits of the port shall be extended so as to include the place on which such wharf, quay, stage, jetty, pier, erection or mooring shall have been made, erected, or fixed, it shall be lawful for the Commissioners, with the sanction of the Local Government in writing, to remove, fill up, or destroy such wharf, quay, stage, jetty, pier, erection or mooring:

Provided that any person who may have lawfully made, erected, or fixed such wharf, quay, stage, jetty, pier, erection or mooring, or who may have acquired a prescriptive right thereto by possession of sixty years or upwards, his representatives or assigns, shall be entitled to institute a civil suit for the award of compensation to him for the injury caused by the removal, filling up or destruction hereinbefore mentioned.'

He said:—"I think I interpret the general feeling of the Council when I say that if the objections to this clause are what has been stated, they are not of a very formidable character, and there is no great gulf between the Hon'ble Mr. Moore and myself. The only reason why no such clause as that to which the hon'ble member refers has been inserted is, because it is not usual to do so; because it is obviously right and proper that the Lieutenant-Governor should consult the persons to be affected, that being the usual way for the management of business. If that is the only objection raised, there will be nothing to prevent the insertion of words which will substantially secure that the interest to be affected has warning of the intention of the Port Commissioners before any order is passed." [The President:—"That could be done by rules."] "So far that objection can be easily removed.

"The other objection which has been taken is, that the words used are obscure. The question is, whether the obscurity is to be found in the framing of the amendment or in the subject-matter of it. If the matter itself is obscure, then legislation regarding it must, to a certain extent, correspond to that obscurity. These words were very carefully selected because it was supposed that they honestly conceded the whole principle which the Hon'ble Mr. Moore has enunciated, and which I may say generally is accepted by this Council as much as by those outside, namely, that if the Port Commissioners have to acquire any private rights they must pay for those rights. The idea of confiscation is entirely repugnant to every member of the Council, and none of us repudiate the idea less strongly than the Hon'ble Mr. Moore himself.

"The whole difficulty lies in the question, whether or not any rights do exist? It is perfectly true that the India Act of 1875 was framed with scrupulous care to prevent the possibility of its being interpreted against private rights. At the same time, I am sure, the hon'ble member will remember that Mr. Hobhouse, on being pressed to go further, not only to protect private rights but to bestow rights, said that the section would not go so far. If the India Council were asked to arbitrate in this matter, it was very probable their decision would not be in the direction wished; but they were careful to maintain any rights which did exist, and that is precisely what my amendment is intended to do.

"Now in a matter of this kind there ought not to be any strong party feeling, because it is, if I may say so, an interest legislating for itself. In many

cases where the Government or the Legislature are deciding matters, unfortunately they are obliged to recognise the existence of rival interests. The Government, whilst considering the interests of the whole community and representing it, occupies the position of an arbitrator, and is obliged to take cognizance of the fact that there are rival interests, and that it must endeavour to hold the balance evenly between them. But fortunately in this instance there are no rival interests. The Government is merely legislating on behalf of the Port Trust, and this Trust may be fairly described as a body in which the trade and commerce of Calcutta is able to organise itself for the purpose of its own benefit, for the purpose of facilitating and improving the trade of the port.

"On the other hand, the objections are raised on behalf of individual members of the community engaged in the trade of the port. So that really we here enjoy the special advantage that we are not in any way deciding between rival interests, or in any way defending one interest against another; but simply we are considering within the circle of one and the same interest how much ought to be given to the interests of the trade as a whole, and how much is fairly due to the interests of its individual members. And on this matter I am bound to say that the remark made by the Hon'ble Mr. Moore, that it is the wish of those interested in the trade that the greatest possible liberality should be shown to individual interests, ought to commend itself very much to our consideration.

"Still we are not legislating for the hour, and we must not, therefore, attach too much weight to what may be merely the sentiment of the hour. We must try and frame the law in accordance with sound and tenable principles, and must bear in mind that as the Port Trust are a body which only levies what it needs for its expenditure, and that whatever compensation is to be paid must come from the trade of the port as a whole, and whatever is saved is similarly saved to the trade of the port. Therefore I hope it will be fully realised by every member of the Council that, this case is not a very invidious one, and can in no case subject us to any invidious criticism of sacrificing the interests of one class to those of another. What we are considering is, how far the trade and commerce of the Port of Calcutta can be legitimately charged for the compensation to be paid to individual members whose interests come into conflict with those of their own body. Now putting it in that way, I must say it seems to me that the answer ought to be very simple; that every private right ought to be scrupulously respected.

"But is not it equally clear that to go beyond this is wrong and bad legislation? Supposing there is no right; supposing somebody is wrongly holding adversely to the interests of the community at large; is it not equally clear that the interests of persons with no rights ought not to be allowed to block the interests of the community? Is it not perfectly clear that the interests of the community are paramount? If you admit these two principles—and I can hardly conceive any one contending that they are not proper principles—then we are justified in passing the present amendment. We carefully preserve existing rights. Power must be given to the Port Commissioners to remove any jetty or wharf, or other structure which interferes with the working of the port; but then comes the question how far compensation ought to be given. The amendment says: 'Provided that any person who may have lawfully made, erected, or fixed such wharf, &c., or who may have acquired a prescriptive right thereto by possession of sixty years or upwards, his representatives or assigns, shall be entitled to institute a civil suit for the award of compensation.' We are told that this is ambiguous, but the ambiguity is in the character of the right, not in the wording of the section; and this is an ambiguity from which we cannot escape. We say that if a person has lawfully put up a particular jetty, then he shall be entitled to sue for compensation. Surely, this is as much as we can be fairly expected to say. If it has been lawfully put up, a suit for compensation will lie; and if, though not lawfully put up, a prescriptive right can be shown, in that case also a suit can lie for compensation. Therefore do we not here do everything that can be asked, unless we are asked to give more than exists? We say that, private rights are to have their full sixteen annas in the rupee: we only object to giving them twenty-four annas.

"The objection which fairly lies against the Hon'ble Mr. Moore's amendment is, that it makes the Council the judge beforehand of a matter which should be left to the judgment of a Court of Law, namely, that compensation shall be given; that is to say, that though the Court may find that there is no case for compensation, yet we are asked to decide beforehand that compensation shall be given.

"It is well known that Courts of Law are on the whole sympathetic with the rights of individuals, and yet we are asked to legislate that in all cases compensation is to be given; that the Court is not to decide upon the question whether any compensation ought to be given, but only what the amount of compensation should be. I appeal to you to say whether, in reality, it is not *we* who have principle on our side; whether it is not *we* who are raising our protest against confiscation, i.e., the confiscation of the rights of the public? If the principle be what the Hon'ble Mr. Moore recommends, if it is only a question of this principle, I think he would have every one of us on his side; but his own amendment does not carry out the principle. It seeks to add something to private rights. The amendment framed here has been scrupulously worded with the precise object of giving effect to what the Hon'ble Mr. Moore asks, namely, that there should be no confiscation of rights which exist; but we say also that there should be no addition of rights which do not exist.

"I may even say that my amendment goes further. Although by a law of twenty years' standing greater powers are given, namely, that the law says that no compensation shall be given, we limit it to what we think right and proper, and just; we amend the law and say, provided the structure is lawfully erected, or has acquired a prescriptive right, compensation is to be given.

"If no further fault can be found with the amendment than what has already been alleged, I ask the Council to say in what respect it falls short of what is right and proper? Does it not concede everything which the earliest opinion, and even the second opinion, of Mr. Woodroffe asked for? It concedes the case in which jetties have been lawfully put up, and the removal of which causes injury, and in such cases it specially prescribes that compensation may be claimed; and it leaves to the Courts to determine whether, according to the law of the land, a case for compensation has been established or not.

"Therefore, I hope, on all these grounds the Council will see its way to accept my amendment. I say it does not differ much from the Hon'ble Mr. Moore's amendment, but where it does differ, it is precisely upon those points on which the Council ought to insist, namely, that it refuses to give further rights—rights which do not exist; it refuses to say that a person who has not a right to compensation shall have right to get it. With these remarks I beg to recommend my amendment to the Council."

The Hon'ble Mr. PEACOCK said:—"I desire to say a few words in support of the Hon'ble Mr. Moore's amendment; and I support the amendment chiefly on the ground that, by the legislation of the Government of India, an example has been set which, I think, might well be accepted by this Council. In the Acts of 1875 and 1889 largely, and certainly in the Act of 1855 to a smaller extent, not only was there no infringement of private rights—perhaps I ought not to say infringement of rights, as that would be going too far—but certainly any interference with private property has been carefully avoided.

"In section 57 of Act V (B.C.) of 1870 for the first time this principle of interference was introduced, in so far that it gave to the Port Commissioners certain rights which, it seems to me, might be carried too far in certain cases. But in section 55 as proposed in the Bill as amended by the Select Committee the same thing is re-enacted, and to a greater extent, in so far that retrospective effect is given to this power. In this section, however, there is a proviso added, that it shall be lawful for the Local Government to direct the payment of such compensation as under the circumstances may seem fair and equitable.

"But in the amended section proposed by the Hon'ble Sir Henry Harrison this proviso is entirely withdrawn, and he has explained the reasons why it was withdrawn. I am bound to say that, speaking for myself, that does not appear

to be altogether satisfactory. The Port Commissioners have now the power of doing anything in the way of removing jetties or wharves, for which they can obtain the sanction of the Lieutenant-Governor. Now, I venture to say that the Port Commissioners will never have any difficulty in putting forward so plausible an *ex parte* case that it will be almost impossible for the Lieutenant-Governor to refuse sanction. At all events, I venture to predict that sanction will be withheld in very few cases.

"Of course I know the argument which has been and which will be used against me that these encroachers on the foreshore are persons without any semblance of right, and are consequently not entitled to any consideration whatever. I am bound to admit that in this argument there is very great force, and if it were so that the limits of the port were never likely to be largely extended, I should be with the Hon'ble Sir Henry Harrison; but when we have to consider the probability, or certainly the possibility, of the port limits being extended at any moment to almost any extent in either direction, I think the case is different.

"Take the case of a man who at Titaghur erects a jetty for the landing of his goods. This may have been done even before the passing of Act V (B.C.) of 1870; he knows that he is well outside the limits of the port; he thinks, as far as he is capable of thinking on the subject, as in all probability his ideas of the rights of the Government to the foreshore are not very clear, that what he has done is absolutely legitimate; it interferes with no traffic of the river, neither can it be said to be an obstruction. But because by a stroke of the pen, as the Hon'ble Mr. Moore said, the limits of the port are extended so as to include this erection of his, it may be swept away at a moment's notice without any compensation.

"I cannot help thinking in the case, more particularly where the erection is a long way out of the port limits, that a provision such as this is likely to operate harshly. I know that I may also be met by the statement that all this opposition to section 85 is unnecessary and uncalled for; because it may be assumed that because the Port Commissioners have never done anything high-handed or inequitable, they never will do so. I am sorry I cannot accept this proposition. It may be taken for granted that the Port Commissioners will do nothing which they believe to be unfair and inequitable in any way; but at the same time, when a project is under consideration, it is astonishing how easily the facts are made to fit with what is desired; how private rights are lost sight of, more particularly where the infringement of those private rights costs nothing. For these reasons I support the amendment of the Hon'ble Mr. Moore."

The Hon'ble Mr. NOLAN said:—"The motion which stands in my name on the list of business, to the effect that the existing law, as embodied in section 57, Act V (B.C.) of 1870, should be retained without alteration, was framed when the only alternative proposal before the Council was one which many considered defective, and which has since been discreetly withdrawn. The amendment now put forward by the hon'ble member in charge of the Bill seems to have been drawn with the intention of meeting, so far as is thought practicable, the wishes of the hon'ble members who represent the commercial interest, and that appears to me to be the proper course to adopt. I, therefore, support the Hon'ble Sir Henry Harrison. The law in its present form was passed at the instance of the commercial members who sat in Council in 1870, and may very properly be altered on the motion of their successors, to whose opinion we all attach the greatest weight. Indeed I would be inclined to go further, and to let the Hon'ble Mr. Moore and those who act with him regulate the matter precisely as they propose, if the effect of our decision could be confined to the area with which they desire to deal. The section itself is of no great importance; it has been in existence for twenty years without ever being put in force, and, as the procedure it prescribes is less convenient than that of the Land Acquisition Act, it might exist unused for another century. It is the Mrs. Harris of our legislation, much talked of, but never seen. I wish we could let the Hon'ble Mr. Moore deal with it just as he wills, but unfortunately his motion is so worded as to touch other interests not contemplated by him, and to be most inconvenient as a precedent.

"In the first place, his amendment provides that private wharves and so forth shall be interfered with only 'when the safety of navigation, or the improvement, maintenance, or good government of the port, so requires.' To this there is no objection whatever; but the Hon'ble Mr. Moore fails to indicate any authority to decide whether such requirements exist or not, and thus silently remands the issue to the ordinary tribunals. This is a new principle in Indian legislation; all previous laws for the acquisition of land for public purposes having made the Local Government sole judge as to whether the land is really required or not, and I fail to see how any law can be worked without some such provision. The alternative is to leave the question to the Courts of Law, calling on the Judges to pronounce what is or is not requisite for navigation and good government, and thus creating a new source of litigation. This, however, is a small matter, to which if it stood alone I would not refer.

"But in the second place, while the Hon'ble Sir Henry Harrison provides for compensation in every case where a wharf has been lawfully erected, the Hon'ble Mr. Moore goes further, and would liberally give compensation whether the erection was lawful or not. Now this might be generous were we dealing with our own money; but it seems scarcely fair when the general taxpayer has to pay for all. And regarded in the light of a precedent, I cannot but consider the studied omission of the word *lawfully* as of the worst example. In ports, such as Calcutta, the public right of way on our great rivers is guarded by stringent laws and an elaborate organisation; but in the interior, the District Magistrates are left to defend our communications as best they can against the attacks of a hundred riparian proprietors, each very naturally caring less for the general commerce of the country than for his own private pier, or fishing stockade, or landing charges. The struggle is always going on with varying success. I speak of it from experience, having had to try many prosecutions of the kind myself as a Magistrate. Now what will be the effect on such contentions of the omission of this word *lawfully*? Obviously to indicate to those concerned that all constructions by riparian owners are legal in the opinion of this Council. Such a maxim, published without qualification, would have a very mischievous tendency by encouraging encroachments of every kind on the most important highways of our Bengal commerce; and I must maintain that the maxim itself is altogether incorrect, as a person may be the owner of land between high and low-water-mark on a tidal river, and yet have no right to make thereon any permanent erection to the injury of navigation, or without the sanction of some officer appointed in that behalf. Take, for instance, the case of a proprietor within the present bounds of the port, who has a title to the foreshore, and examine what right we have left him to make future erections, and what compensation we provide for him in case such erections are destroyed. This matter is settled by the section of the present Act preceding that now under discussion, a provision which has never been opposed, and which is re-enacted without objection in the Bill before us. It runs as follows:—

'It shall not be lawful for any person or persons, save the Commissioners, to make erect, or fix below high-water-mark within the port any wharf, quay, stage, jetty, pier, erection or mooring without the consent in writing of the Lieutenant-Governor first had and obtained. Any matter or thing which may be so erected or fixed may be removed by the Commissioners, and the persons who shall have so made, erected or fixed any such matter or thing shall be liable on conviction to a fine which may extend to Rs. 1,000, and to a further fine which may extend to Rs. 100 for every day during which such matter or thing shall have been permitted to remain so made, erected or fixed after notice to remove the same shall have been given.'

"In Calcutta, it will be seen, instead of compensation, the proprietor who builds a wharf without authority has to pay a fine of a thousand rupees to begin with, and has the prospect of subsequent fines as refreshers. Now the original proprietary rights of zemindars within the port were precisely the same as those of the zemindars whose lands lie on the other side of that fleeting boundary, from which I draw the inference that no one approving section 56 of Act V (B.C.) of 1870, and the corresponding clause in our Bill, can maintain that all proprietors as such have an indefeasible right to build wharves of any description on the foreshore they possess by the river Hooghly. It is only on the supposition that they have no such right that the law, as the Hon'ble Mr. Moore agrees to re-enact it, can be defended.

"In explanation of this limitation on the powers of zemindars, even when the land has been settled with them, I may repeat the statement contained in a written opinion of the Hon'ble Sir Charles Paul's given in 1873, and subsequently confirmed by Mr. Woodroffe, that the foreshore originally belonged to the Crown. The Crown can grant rights over it, and has done so by Regulation XI of 1825, which gives to all riparian proprietors a contingent and reversionary interest in river beds, inasmuch as the land will become an accretion to their estates when the waters change their course. Moreover, the banks and even the beds of rivers have been settled with zemindars in many cases, thereby conveying to them a right to the property for proper purposes. But the interest thus conveyed is subject to the dominant right of the public to use the river up to its utmost limit, and the adjoining tow-path, if such there be, for navigation, and inferentially to the right of the legislature to regulate that use, prohibiting whatever may interfere with its due exercise. How this was provided for at the time of settlement I may indicate by referring to the proceedings of Mr. Crow, Deputy Collector, who settled fifty-five villages near Calcutta in 1847. I will read an extract from his final report:—

'These lands therefore are in every sense of the word in their *bona fide* possession down to the low-water-mark in the dry season, and these landholders must accordingly be made to pay the Government revenue assessable on these lands.

'The third point regarding these banks is the right to track boats along the riverside. Of this privilege I think the boatmen should never be deprived, notwithstanding any settlement that might be made for the lands over which they are obliged to pass with ropes, or to which they have to fasten their vessels, not to mention the loss of life and property which might attend. Any interference on the part of the landholders with the boatmen at particular times—the obstructions to the navigation of the river (situated as the Hooghly is on the side of the capital of our Eastern Empire) that would follow from any prohibition which our inconsiderate landholders might think fit to put on the privilege of tracking and fastening boats—would be so serious an injury to the interests of the public that the very thought of allowing these people to interfere with the said privileges could not for a moment be entertained. Yet want of due attention to these particulars has been the cause of serious and dangerous obstruction to the navigation along the bank in this and other localities near the city. Ghats with high sides and pucca bastions of various kinds have been built up in many places right across the tracking paths, and several kinds of other obstructions caused without the least regard to the comfort and safety of those who are obliged to navigate along the banks.

'With due regard to these circumstances, which I consider of the last importance, I have, in settling these alluvial lands with the owners of the kurari properties, distinctly explained to them that the settlement now made with them will not in any manner entitle them to deprive the boatmen, who are obliged to make use of the tracts settled with them, of any of the least privileges which they have hitherto enjoyed; nor, indeed, will they be permitted hereafter to raise new obstructions along these tracks without the sanction of the authorities entrusted with the conservative care of these public thoroughfares.'

"This is the settlement to which the riparian proprietors referred when on former occasions they impugned the action of the Port Commissioners, and may be taken as indicating the title by which the land affected by this section is held.

"I willingly acknowledge that most of the works constructed on the river-bank are useful or ornamental structures, which do not interfere with navigation, and have therefore been lawfully made. For these, compensation would be payable under the Hon'ble Sir Henry Harrison's amendment. But some are said to be obstructions to which the District Magistrates might turn their attention with advantage. These are unlawful, and if they are removed, why should we give compensation for the nuisance? If the commercial members, and those with whom they act, think otherwise, they will doubtless be able to give effect to their views, commanding, as they do, the ascendant influence on the Port Commissioners. In the end, probably, compensation will be paid, however we word the section. I doubt if anyone will gain or lose a rupee by our action to-day. But I object to moulding our laws on the assumption of a principle which is not correct, and which, if generally applied, would be most injurious to commerce—the assumption, namely, that all constructions on the foreshore belonging to private owners are lawful.

"Before sitting down I would say a word in defence of the existing law, which we will naturally re-enact should neither of the amendments before us be adopted. It has been represented as a measure for confiscating property without compensation, but nothing could be more remote than this from its

character. Its real object is to enable those who constructed suitable wharves and so forth after its enactment to secure themselves by obtaining the sanction of Government, with full assurance of compensation in the event of an extension of the port; also to deter proprietors from building obstructions which could not be sanctioned. The restriction which it implies as to riparian rights near the port is much less than that imposed within the port by our present Bill. Applications under the section are constantly made and are dealt with in a very liberal spirit. These applications and the petitions made to Government in 1874 show that the law is much better known to those concerned, than the dissenting members of the Select Committee believed. If any one has through ignorance failed to apply hitherto, he can do so now that attention is drawn to the subject. As to the complaints that the section has been worked harshly, they rest on a misapprehension, for, otherwise than as a procedure for voluntary registration, it has never been worked at all. The disputes have been under the Land Acquisition Act, and with regard to another section of this Act, never as to anything done under the authority of section 57. While willing to accept any modification which does not give a sanction to nuisances, I cannot help thinking that this part of the law might very well have been let alone. It has never been worked to the injury of any man, and has been useful, in its way, by giving an assured title to the owners of many useful works."

The Hon'ble DR. RASH BEHARY GHOSE said:—"I regret that I am unable to accept the Hon'ble Mr. Moore's amendment. Apart from the criticisms which have been made by the previous speakers, it seems to me that the amendment, as it stands, is open to some very serious objections. It says, amongst other things, that it shall be lawful for the Commissioners, when the safety of navigation or the improvement, maintenance or good government of the port so requires, to remove, fill up, or destroy such wharf, quay, &c., and it then goes on to say that, if the wharf, &c., is destroyed, the owner shall be entitled to compensation.

"But I take it to be undoubted law, quite apart from any statutory provision on the subject, that when any such structure, whether erected by the Government or by any private individual, interferes with the safety of navigation, it becomes a public nuisance, and it is open to any subject of the Crown to abate the nuisance: and I do not see any reason why the Port Commissioners should be the only persons—in this country—who are to be incompetent to exercise a privilege possessed by all other subjects of Her Majesty. It is elementary to say that you do not give compensation for removing a public nuisance, and that it is in the power of any person to abate it. A public nuisance is a public offence, and it would be absurd to give compensation to a public offender.

"Then, again, I cannot congratulate the gentleman who drafted this amendment on his skill in drafting. We have heard something said about the English of the Bengal Council. But the English of our opponents is not altogether unexceptionable. Now this amendment, clause (b), I find speaks of 'land belonging to the private owner, whether acquired by grant from the Government or by prescriptive right;' that is to say, land acquired by prescriptive right. But, as every lawyer knows, you do not acquire land by prescriptive right, you may acquire it by prescription; but to speak of land being acquired by prescriptive right is language not familiar to lawyers. This, however, is a comparatively trifling objection.

"But there are graver objections to the proposed amendment. Compensation is claimed by the Hon'ble Mr. Moore whether the structure was lawfully or unlawfully erected. I am not now dealing with cases in which what was originally unlawful might, in the course of time, ripen into something not unlawful. The structure must be either lawful or unlawful. If it is lawful, then the amendment proposed by the Hon'ble Sir Henry Harrison would entitle the injured person to compensation. If it was an unlawful work, I do not think anybody, however liberal his views may be, however strong his notions may be with regard to what is called the sanctity of private property, would propose to give compensation for something which was unlawful. I find that the Hon'ble Mr. Moore, acting upon the opinion of the eminent Counsel consulted by the Chamber of Commerce, objects to the use of the word 'lawful' in the Hon'ble Sir Henry Harrison's amendment. If that is the only objection which the ingenuity of Counsel can make to the amendment, I do not think we have much to fear from hostile criticism.

"Confiscation of private property is no doubt a very good cry, and it is a cry which it is very easy to raise; but is there any foundation, having regard to the amendment proposed by the Hon'ble Sir Henry Harrison, for saying that we are going to confiscate private rights? We are only going, under this Act, to authorise the Port Commissioners to remove unlawful structures; but, certainly, we are not going to confiscate anything which was lawful either when it was done or which, by reason of long enjoyment, has become lawful.

"I do not propose to follow the Hon'ble Mr. Nolan through the discussion which he has raised on the vexed question, as to the rights of the Crown or of the Government in this country to the foreshore of tidal or navigable rivers. The question is, no doubt, surrounded with a great deal of difficulty; and as the amendment proposed by the Hon'ble Sir Henry Harrison renders the discussion wholly unnecessary, I do not see the good of engaging in what, under the circumstances, would be a purely academic discussion.

"We render unto Her Majesty's Courts of justice the things which belong to them: and if I understood the Hon'ble Mr. Moore rightly, when this matter was before the Select Committee, the only grievance he felt was that we, the Members of the Bengal Legislative Council, from our imperfect appreciation of the law on the subject, took upon ourselves to determine the particular cases in which alone compensation was to be allowed; instead of leaving the determination of those cases to those who are best able to deal with them.

"Now, the Hon'ble Sir Henry Harrison's amendment proposes to do what we were told we ought to do; whilst the amendment put forward by the Hon'ble Mr. Moore would virtually exclude, as the Hon'ble Sir Henry Harrison has already pointed out, from determination by the Courts of justice of those questions which we were told only two short months ago were eminently proper to be dealt with by Her Majesty's Judges."

The Hon'ble SIR ALFRED CROFT said:—"It is with great diffidence that I rise, and I do so merely to ask what is the interpretation of the last line of the Hon'ble Mr. Moore's amendment. It has been said by the Hon'ble Sir Henry Harrison, and confirmed by the Hon'ble Dr. Rash Behary Ghose, that if the question is referred to the Courts of Law when the Port Commissioners and the private owner cannot come to an agreement, the Courts are bound to give compensation, although the structure has not been lawfully erected.

"It appears to me that the last line of the Hon'ble Mr. Moore's amendment bears no such construction. It does not say 'or by the Civil Court in which a suit may be brought to determine the amount of such compensation,' but it says 'to establish and enforce such right of compensation.' What is there in the amendment to prevent the Court from declaring that there is no such right? And if no such right can be shown, that is, if the structure has not been lawfully erected, the compensation awarded will be *nil*.

"But I would now take the opportunity of saying that each of the three amendments on the paper seems to me, in the light of the discussion that has preceded, to be open to objection; and I should be very glad to know how these objections are met. I take first the Hon'ble Mr. Nolan's amendment. The objection to this seems to lie in the assumption which it makes that every wharf or jetty built below high-water-mark must have been unlawfully erected, unless the written consent of the Lieutenant-Governor of Bengal has been obtained. But I understand from what has been said by previous speakers that this is in some instances a doubtful matter, and if so, it cannot be right for this Council to declare that in no such case shall compensation be given, for that is a point which in such cases can only be decided by a Court of Law.

"Then the Hon'ble Sir Henry Harrison's amendment leaves out two points for which provision is made in the Hon'ble Mr. Moore's amendment. The first point is, that it does not state the grounds upon which it shall be lawful for the Commissioners to remove any such structure, a point for which the Hon'ble Mr. Moore's amendment does provide; because it says that the structure shall only be removed if the 'safety of navigation, or the improvement, maintenance or good government of the port so requires.' This point has been referred to by the Hon'ble Mr. Nolan, who objects to the proviso on the ground that it does not state who is to decide. It seems to me desirable that such a proviso should be adopted, qualified by some such words as 'when in the opinion of the Lieutenant-Governor the safety of navigation, &c., so requires.'

"The Hon'ble Mr. Nolan and other hon'ble members have conclusively shown that it would not be right to omit the word 'lawfully' before 'made' in the line preceding proviso (a) in the Hon'ble Mr. Moore's amendment, because it appears that works may be raised on private lands which still are not 'lawful' because they interfere with public rights. If, therefore, no compensation ought to be given to private owners who erect structures which interfere with public rights, then we cannot accept an amendment which gives them a right to bring a suit for compensation.

"The Hon'ble Mr. Moore's amendment further provides for cases in which wharves and piers have been erected on behalf of the public. It provides that in case such works are removed or destroyed, corresponding works giving equal facilities shall be provided by the Commissioners. But the Hon'ble Sir Henry Harrison's amendment leaves out this proviso."

The Hon'ble SIR CHARLES PAUL said :—"That is provided for by the further section (85A) to be moved by the Hon'ble Sir Henry Harrison."

The Hon'ble SIR ALFRED CROFT said :—"In that case my remark does not apply."

The Hon'ble MR. ALLEN said :—"It appears to me that Act V (B.C.) of 1870 has hardly met with fair treatment in this Council up to the present. We may assume that the Bengal Council which passed Act V of 1870 was not less competent or less capable than the Council which meets here to-day; and we may fairly presume that in passing what has been said to be a very arbitrary measure, with little regard to the rights of private individuals, the members of that Council had just as much regard for the rights of private individuals as any one here present. Now if the law as a whole is examined, it will be found that not the smallest wrong was perpetrated by the section of that Act now under consideration. The principle upon which the Act of 1870 was based was, that the responsibility for taking care of the port of Calcutta, for levying tolls on trade and for raising money to construct works of utility, by which the facilities for shipping and unshipping goods would be increased, should not rest upon private individuals; but that a public body under the control of the Government should be incorporated, in which the management would vest: looking not for dividends to be divided among shareholders, or profits to be carried off by transitory merchants, but that this public body should borrow money and simply provide for paying interest thereon, not charging the shipping anything more than was necessary for that purpose.

"The portion of the river Hughli upon which works for the discharge of cargo could be constructed is limited, and therefore such a provision was very reasonable: it constituted a monopoly which must prevail against all private rights in the port. As soon as this public body had constructed jetties and other necessary works, it was invested with the power of forbidding ships to go to any private jetty; they must come to the public jetties and pay the tolls levied at such jetties. At the time when that provision was framed, the Peninsular and Oriental Steam Navigation Company's jetty was the only jetty which had any existence, and therefore in forbidding the erection of jetties the framers of the Act of 1870 were touching no existing interests. They were merely laying down rules for the future, and warning persons who had private property on the banks of the river that they must use their private rights, subject to the rights of the Port Commissioners; and that they must not erect private jetties to compete with those erected by the Port Commissioners.

"Having made this provision with regard to jetties within the port, they further provided that in the case of jetties constructed in any other part of the river above or below the limits of the port, without the sanction of the Lieutenant Governor, afterwards, should the port be extended so as to include that part of the river, such jetties should have no advantage over jetties which might be so constructed within the former limits of the port. They touched no jetty then in existence, but they warned private persons that they should not put up such jetties, without sanction from the Lieutenant-Governor, below high-water-mark. They touched nothing above high-water-mark; but they clearly asserted that the property in the foreshore below high-water-mark

was in the Government. And whatever assumed or supposed right the zemindars may assert, there is the decision of the Privy Council that the property in the bed of the river Hugli below high-water mark, belongs to the Government.

When we in the Select Committee had to consider that section, we found as a fact that the provision in Act V of 1870 had not been used; but instead of allowing the law to remain as before, we made a suggestion that, when any private jetty below high-water-mark is removed, the Lieutenant-Governor may order the Commissioners to make compensation. For my own part, I consider that in doing that we gave the fairest conclusion to the whole question which it was possible to give. As a shareholder in several of these mills, I myself should infinitely prefer the mercy of the Lieutenant-Governor, to taking my stand on the supposed legal rights that the Chamber of Commerce pretend to maintain.

Counsel's opinion has been taken in this matter. Mr. Woodroffe's name, no doubt, stands for a good deal; but, I must say that, as far as I have experience of Counsel's opinion, consulting Counsel is very much what consulting the Delhi *practic* used to be. The consultant invariably gets an opinion which confirms him in the course which he had already determined upon. At the same time Counsel takes good care, while confirming his client in his opinion, whatever the result, that his own professional reputation shall in no wise suffer. The manner in which this is done is ingenious. Mr. Woodroffe's name is sufficient guarantee that any naked statement of law by him shall not be open to objection. His professional reputation would be terribly affected if he laid down a proposition of law which was incorrect; therefore, as far as the mere statement of the law goes, both the Advocate-General and I have no objection to what is laid down by Mr. Woodroffe. But the Chamber of Commerce imagine his opinion is entirely on their side. How is this result achieved? It is in the manipulation of the facts to which the law is to be applied. There the sympathetic effect comes in so that the client's feelings are flattered, and he feels himself a most ill-used individual. Let us see how Mr. Woodroffe does this. In paragraph 2 at the top of page 8, Mr. Woodroffe says:—

Paragraph 6 of the Hon'ble Mr. Moore's minute of dissent gives instances in which grants of the foreshores of such rivers have been made to private individuals, or in which individual subjects have, by prescription, acquired rights in or over such foreshores in derogation of the rights of the public.

Well, Sir, I challenge a reference to that paragraph of the Hon'ble Mr. Moore's dissent. There I find no such instances given, but I find a very modest statement by the Hon'ble Mr. Moore of the possibility that such a case may exist. The actual instance to which the Hon'ble Mr. Moore refers, as I have learned the facts from him and the Advocate-General, is this: A certain Deputy Collector, when out at settlement work, found some logs of wood lying on the bank below high-water-mark, and thereupon made an extra assessment on the riparian owner in respect of the use he was making of the foreshore. Does this, as far as we know, unauthorized zeal of a Deputy Collector amount to a grant by the Crown or Government of the foreshore of the river? Under the colonnade of the Great Eastern Hotel here you may see a number of hobby-horses, boxes and other articles on the foot-path; suppose the municipal assessor, when next valuing the Great Eastern Hotel, clapped on an extra Rs. 5 or Rs. 6 on account of the benefit thus enjoyed; is that to be deemed a grant to the Hotel of so much of the foot-path? Mr. Woodroffe apparently thinks it is.

The second instance noticed by the Hon'ble Mr. Moore is this: A certain riparian owner acquired the land from a zemindar who professed also to convey the foreshore, and before doing so submitted the title to an eminent firm of solicitors, and this the Hon'ble Mr. Moore says is *prima facie* evidence of title to the foreshore. Did he consult Mr. Woodroffe on that point? Would Mr. Woodroffe consider that the mere passing of the title through a solicitor's office was evidence of anything? Probably, if Mr. Woodroffe had been consulted he would have told him that three-fourths of the litigation which arises is due to the blunders of eminent firms of solicitors. The fact that an eminent firm of solicitors passed a title, to my mind, goes a very small way. A flimsy title backed by money is, for practical purposes, no bad thing;

and sometimes foundation enough on which to issue a prospectus and start a company. The eagerness to float companies has often been a zeal which has outrun discretion. Even if the legal point as to the foreshore between high-water and low-water is conceded to mill-owners, I believe it will be found they have transgressed in putting up jetties much below low-water-mark.

"In the second opinion of Mr. Woodroffe, the manipulation of facts is carried to a greater extent. The whole of the last paragraph of the second opinion consists in the quiet assumption of a state of things, the exact opposite of which we say is the true state. But to meet this the Hon'ble Sir Henry Harrison has introduced an amendment, by which every jetty lawfully erected is secure of compensation. What has Mr. Woodroffe to say to this? The first paragraph of his third opinion declares that this amendment offers little security to existing jetties. This shows how from the first he had a strong suspicion that on the law of the case these gentlemen have not a leg to stand upon. No additional security for existing jetties, when every lawful jetty is to have compensation! If this is not telling them that they have no stronger case now to go to court with than they had before, then I am incapable of interpreting language.

"But the Hon'ble Mr. Moore has brought in the Government of India against us, as, in its proceedings of 1875, overruling and crushing up our Act of 1876. I very much regret the speech made by Mr. Hobhouse in 1875, as I think with all submission, that his remarks as to the intention of the Legislature in 1855 were made simply under a misapprehension, as to the bearing of the section in that Act. I see great objections to assuming that the Council in years gone by was less competent or less able than the Council of 1875; and I have a shrewd suspicion that the Council of the Government of India in 1855 was as sensible and as careful of private rights, as the Council of 1875. The only change made, however, by the Act of 1875 was to introduce the saving clause about private rights into the earlier portion of the section defining the limits to which the port might be extended by the Local Government. But the Hon'ble Mr. Moore alleges that this restriction has a sort of coercive authority over us sitting in this Legislative Council. The Act of the Government of India of 1875 does not touch the Act of this Council. The section is purely a direction for the Executive Government. The Executive Government it is that has to extend the limits of the port; but when so extended, our Act of 1870, would come into full force throughout the whole area.

"The two Acts are of equal authority; the one legislature is equally sovereign as the other in authority. The Government of India, so far from having any intention to touch our Act of 1870, has shown its marked approval of it in the best way; for in 1879, in passing a Ports Act for Rangoon, the Government of India actually re-enacted section 57 of Act V (B.C.) of 1870:—

'In case any wharf, dock, quay, stage, jetty, pier, erection or mooring is, after the date on which this Act comes into force, without the consent in writing of the Local Government, made, erected or fixed below high-water mark without the limits for the time being of the port, and thereafter the limits of the port are extended so as to include the place in which such wharf, dock, quay, stage, jetty, pier, erection or mooring has been made, erected, or fixed, the Commissioners may remove, fill up, or destroy such wharf, dock, quay, stage, jetty, pier, erection or mooring, without making any compensation therefor.'

"Would it be possible to have more complete evidence of thorough approval of our legislation than to find the Government of India in its legislative capacity, with all the talent available in its Legislative Council, instead of enacting a new section, bodily transferring our section into their Act?

"As to the amendment now before the Council. The Hon'ble Mr. Moore proposes that the Port Commissioners shall be authorized to remove a wharf only in the event of its interfering with the 'safety of navigation, or the improvement, maintenance or good government of the port.' Any man who can once get his wharf on the bed of the Hughli, under the first clause of the Hon'ble Mr. Moore's amendment is protected from its removal, unless it interferes with navigation, lawful or unlawful. That, to my mind, is a most fatal objection to the Hon'ble Mr. Moore's amendment. But there is another objection to the amendment, and that is that there is not the least necessity for

its existence, inasmuch as under the provisions of the Indian Ports Act of 1889, section 12,—

‘If any obstruction or impediment to the navigation of any port subject to this Act has been lawfully made, or has become lawful by reason of the long continuance of such obstruction or impediment, or otherwise, the Conservator shall report the same for the information of the Local Government, and shall, with the sanction of that Government, cause the same to be removed or altered, making reasonable compensation to the person suffering damage by such removal or alteration.’

“The existence of this section in the Ports Act of the Government of India of 1889 does away with the necessity for the Hon’ble Mr. Moore’s amendment, which simply proposes to re-enact in a feebler manner what is already the law. Mr. Woodroffe in his complaisant third opinion objects to the word ‘lawful,’ as being ambiguous. There is precedent enough, seeing the Government of India in the Act of 1889 uses this word. No ambiguity lies in the word ‘lawful,’ but the ambiguity lies in the peculiar circumstances under which most of these jetties have been run out. I take two objections to the first clause of the Hon’ble Mr. Moore’s amendment—*first*, because it does not authorise the Commissioners to remove a jetty erected without any legal right until it becomes an obstruction to navigation; and *secondly*, because it is a mere repetition of section 12 of the Ports Act of 1889; and these objections ought to be fatal to the amendment proposed by him.

“With reference to the amendment proposed by the Hon’ble Sir Henry Harrison, I certainly think it concedes everything that the Chamber of Commerce or the gentlemen in whose name it speaks have any right to expect. But, after all, what is the whole dispute? The whole discussion on section 85 is without any practical bearing. It is a mere fight in the air. I suppose some gentlemen here have kept dogs and know that on full moon young dogs bark furiously at the moon. The legend is, they fear, the moon is about to fall on them. This seems to me the best illustration of the fantastic fears which have stirred up the Chamber of Commerce gentlemen. They are alarmed lest something should happen which cannot possibly happen. The only possibility of its happening is if the port should be extended up the river to Barrackpore. Did any one ever hear of a port that moved up a river? I challenge any gentleman to show me a case, and especially up such a river as the Hooghly. But I quite agree with what has fallen from the Hon’ble Mr. Nolan, as to the importance of not letting in words into this Act which may lead to a false interpretation of the general law, and which would have effects far beyond the port of Calcutta. We know that throughout the mofussil on the banks of rivers the zemindars are asserting rights which are entirely incompatible with the free navigation of those rivers, and for the most part they succeed in carrying their point. Therefore, it is of the utmost importance not to introduce any words in this Act which could in any way strengthen or back up encroachments of this kind.”

The Hon’ble SIR CHARLES PAUL said:—“I wish to say a few words. I consider the subject not capable of any serious discussion. Whilst on the one hand we are to remember that in legislating we should not confiscate property belonging to others; on the other hand we should equally remember that we should not enact anything which would enable the Port Commissioners to throw away their money, and put it into the pockets of people who are not entitled to receive it.

“The Hon’ble Mr. Moore has correctly enunciated his first proposition, namely, that a person should be fully recompensed for the loss of his private rights. I quite agree with him; but if there are no private rights, public money should not be thrown away in paying for what does not exist. The question therefore reduces itself to this: Are there such private rights as have been stated to exist? In 1870, this Council decided that there were no such private rights, and enacted that nobody should, after 1870, make any wharves or jetties without the permission of the Lieutenant-Governor. To that provision of law exception had been taken, and we have been told that we should not decide upon such rights.

“And yet, looking to the Hon’ble Mr. Moore’s amendment, it is plain that we are called upon to recognise such rights as he puts forward, and to give compensation for their removal. But if we are called upon to decide as

to such rights, there are members of Council here present who are quite strong enough to decide upon such rights, and to decide upon them in the way in which Sir Arthur Hobhouse informed the memorialists that he would decide them if he were forced to do so. It was because this Council did not wish to decide upon such rights that a middle course has been taken in the proposal put forward by the Hon'ble Sir Henry Harrison.

"Now the Hon'ble Mr. Moore wants us to recognise those rights; he wants that, whenever a person puts up a wharf, or a jetty, or a stage on the foreshore of the river, you should, whenever it becomes necessary in the interests of the public to remove such wharf, or jetty, or stage, make compensation as if the man had a right to put up the wharf or jetty there. He wants us to recognise that principle. But if, in the opinion of persons competent to judge, there is no such right, then why should compensation be paid?

"Take the case which the Hon'ble Mr. Allen has put, that somebody, having no possible right to do so, presumed to put up an obstruction on the foreshore of the river. Would it be fair to give him compensation for the removal of that obstruction? The Hon'ble Mr. Moore would say, I do not ask for that. He says compensation should be given when the obstruction is put up on land belonging to the private owner, whether acquired by grant from the Government, or by prescriptive right or otherwise. 'Otherwise' may include by theft or by invasion. There is nothing to prevent a person clandestinely putting up an obstruction in a remote part of the river. Let us see whether the right is one which can exist or not.

"Mr. Woodroffe in his first opinion points out that the right cannot exist when it interferes with the navigation of the river. Therefore, if you ask for compensation, you must first satisfy the person who has to award the compensation that it does not interfere with the navigation of the river, because, if it does interfere with navigation, it is removable under the general law of the land and Regulation XI of 1825.

"Then, take the cases which the Hon'ble Mr. Moore gives of obstructions raised on lands granted by the Government. These grants referred to settlements made by Mr. Crow of lands down to low-water-mark. In considering those cases you would have to examine the meaning of the settlement. What was settled? What was given? Were they given for agricultural purposes, or for what purposes? If you come to the conclusion that they were given for agricultural purposes, that would give a right to cultivation down to low-water-mark.

"We all know that in the dry season lands are in some places cultivated down to low-water-mark, but it never was intended that the settlements so made should be in derogation of public rights of navigation. They could not in any way interfere with the rights of navigation. It never could have been intended that under settlements of that sort a man, instead of growing crops upon the land, would have a right to put up a jetty down to low-water-mark.

"In the case of lands granted by the Government, the parties who ask for compensation would come in and say, this is our land and we can do what we like with it; and if we do put up a house or a stage, we have lawfully done it, and if you remove what we have put up, you shall pay in compensation. If the case is put in that way, it is a case that might admit of the answer already given. And, suppose such a case could be put, it would be a disputed case.

"Then is it right for the Hon'ble Mr. Moore and those who are with him to say that, although the case may well be disputed, whether land granted for purposes of cultivation can be used so as to interfere with the navigation of the river, yet such dispute should be shut out by legislation. Take the case of the consent of the Local Government given in writing, which would be generally considered as a strong case. Even, in such a case, a question may arise as to the competence of the Lieutenant-Governor to give his consent.

"We hear of people in Benares running their sewers into the river and thus polluting the river. I maintain that the consent of the Local Government would not justify any person in committing such a nuisance. The Port Commissioners are entitled to say that compensation should not be given for an unlawful act which was removable before by the executive authority, and which the law under consideration will enable him to remove.

Does the Hon'ble Mr. Moore want us to decide whether in such cases compensation should or should not be given? I, for one, am quite prepared to decide that question. It has been ruled by the Privy Council in *Moore's Indian Appeals*, that the bed of the river Hughli up to high-water-mark is the property of the Crown; and it being so decided by the Privy Council, we may take it, that every person who makes any obstruction in the bed of the river commits an offence for which he may be indicted under the law.

"In England the law is so strict that, if you put up a stake or post in the river you will be liable to be indicted and to be severely punished; and yet can it be contended here that, while on the one hand any person putting up a structure between high-water and low-water-mark can be indicted for a nuisance and subjected to fine; on the other hand he is supposed to possess such a right that he is to be entitled to compensation for the removal of the obstruction? A misconception of this kind could hardly go farther. Therefore, if we are called upon to decide upon the alleged right, we should have no hesitation in deciding that we should give no compensation at all. But since it might be a harsh measure to make this Council usurp the place of the judges of the land and prevent people from making claims, we propose to give them every opportunity to do so. Therefore, the section provides that, whoever lawfully makes or erects any such structure shall be entitled to institute a civil suit for the award of compensation to him for the injury caused by the removal of such structure. This word 'lawful' is used advisedly. Where the facts constitute a thing to be lawful, it shall be lawful; but we say questions of that kind must be determined by the Courts. In the section proposed by the Hon'ble Mr. Moore we have the word 'otherwise.'

"The word 'lawful' is in no sense ambiguous: the word 'otherwise' is clearly so. The amendment first proposed in behalf of the Government was objected to, and now, when the word 'lawful' is put in in order to admit of every possible claim, objection is taken to that word. I do not wish to enlarge on the subject because I always give credit to persons setting up rights that they are actuated by sincere feelings; though I am bound to say that in this case this matter has been looked at with one eye kept open, and the other closely shut, so as not to admit of an adverse view. I think I have shown inconsistencies in the views advanced.

"We have steadily followed the lines laid down by Sir Arthur Hobhouse in the Act of 1875, which, he said, would not in any way prejudice or touch the rights of private property. If there is a cause of action, well and good: compensation will be obtained; otherwise the Courts will not give compensation. What is there to complain of? The Hon'ble Mr. Moore says, here is a wharf erected by me on land granted by Government. If that wharf does not interfere with the navigation of the river, the Courts will give compensation. But if it is erected otherwise, the Courts will not give compensation. How can this Council recognise and confirm private rights, the existence of which is asserted on one side and denied on the other side? The only remedy is to let the Courts decide whether or not those rights exist. If they want a decision on this point, I am quite ready to abide by Mr. Woodroffe's opinion. No lawyer in the land, much less a lawyer of the experience of Mr. Woodroffe, would come to a different conclusion. The law is clear; but, as the Hon'ble Dr. Rash Behary Ghose said, in this country, the question to whom the bed of a river belongs when the river has deserted its course and gone in another direction, is doubtful. It is quite possible it belongs to the zemindar of the adjacent lands with whom the settlement has been made. But that is not the question here. We have here a river which remains in one channel, and in regard to which the Privy Council has decided that its bed is the property of the Government. We must either decide upon the alleged rights ourselves or leave it to the claimants to bring their suits; and the section has therefore been so drawn as to give every possible freedom for legal remedies (if any).

"I need hardly say anything further beyond pointing out, as observed by the Hon'ble Mr. Nolan, that as in the case of large tracts of land the declaration of the Government is taken as final; so where a notification of Government made under similar circumstances regarding a much less important matter, should be admitted to be final. That the parties should have a right to represent their case to the Government is right and proper,

and I have no doubt that some rule or order to that effect will be made. The Government is most desirous to control the arbitrary power of the Port Commissioners, and one would have thought that, having regard to the future constitution of that body, the use of the word 'arbitrary' as applied to them, would disappear. The Bill, however, provides a restraint upon the power of the Commissioners by interposing the judgment of one who, without risking his position, could not act 'arbitrarily'. That people may arbitrarily interfere is possible, but there are checks to arbitrary interference. Government officers and others are subject to some sort of jurisdiction when they act arbitrarily, and the Courts of Justice can be trusted to interfere when public bodies act in infraction of the law.

"I entirely dispute the proposition involved in the section proposed by the Hon'ble Mr. Moore to be substituted for section 85, and I support the amendment of the Hon'ble Sir Henry Harrison, which, I think, is conceived in a spirit of fairness. The amendment proposed by the Hon'ble Mr. Moore would give compensation, whether the act done was lawful or unlawful; and that was a form of compensation which, I think, the Legislature would not be disposed to give out of the pockets of the Port Commissioners."

The Hon'ble Mr. MOORE said in reply:—"It is exceedingly difficult for me to reply to all the objections which have been made to my amendment; especially when arrayed against me is one of the ablest advocates of the Bar, and I have not Counsel at my elbow to advise me. But I find one crumb of comfort in his speech, that he is willing to trust to Mr. Woodroffe's opinion." (SIR CHARLES PAUL:—"His first opinion.") "Well, it is in that first opinion that Mr. Woodroffe says, I have ample reasons for pressing for the protection of existing rights. I am very gratified to find that the whole tenour of the debate concedes this necessity which I have pressed, and there only remains the form of section to be agreed to in place of the existing one. I am perfectly willing to concede the main objections which have been raised to my draft. I see the force of the Hon'ble Sir Alfred Croft's objection that, it is not laid down who is to judge whether a structure is in the way of navigation, &c., and I am willing to meet this by adding in line 6 the words 'when in the opinion of the Local Government.' I also beg to repudiate the idea that I suggest, or ever intended to suggest, that any works unlawfully made should be compensated, for of course, if the law has been broken, the consequences must be abided; and in testimony of this, I am willing to add the word 'lawfully' in line 13 between the words 'was' and 'made,' though, I believe, I am in the alteration to a certain extent giving myself away. Other objections made are more in matter of detail, and if, as the Hon'ble Dr. Rash Behary Ghose pointed out, the words 'by prescriptive right' ought to read 'by prescription,' I alter them to such effect. With the changes thus made I commit my amendment to the votes of the Council."

His Honour the PRESIDENT said:—"Before putting the various amendments to the vote, I wish to say a few words for my own part. And, first, I must say I agree with the Hon'ble Mr. Nolan that for practical purposes the whole fight—and a very interesting fight it has been—has been of a purely academical character, and it is a phantom from whichever point of view you regard it. In the first place, this section only takes effect in case of the limits of the port being extended. Whoever has read the history of the port, which was extended from Calcutta downwards—not because we wanted an extension, but because we wanted Budge-Budge—and really supposes that, under existing conditions, the Port Commissioners will desire to have the port extended up the river—I can only say I cannot understand on what possible grounds such a probability could be expected. From that point of view, I think the whole discussion has been a purely academical one; as also from another point of view, which was put forward by the Hon'ble Mr. Nolan, namely, that the Port Commissioners have had this section on the Statute Book for the last twenty years and have apparently never used it.

"But from another point of view, the discussion has been a very useful one. It has opened out, not without inconvenience perhaps, certain large questions, but it has enabled us to justify the object and history of this section. That some justification is necessary, I think you will admit, when I read to you what has been said about this Council by a gentleman who telegraphs home

information from Calcutta to the *Times* newspaper. Speaking of this section, he describes it as follows:—‘The inequitable and mischievous character of the power proposed to be conferred on the Commissioners in all cases of extension of the port to remove and destroy all buildings’—mark that, please,—not buildings in the bed of the river, nor buildings between high and low-water-mark—but ‘all buildings which may have been erected prior to such extension without formal sanction by the Local Government and without making any compensation.’ This is what we are deliberately accused of doing on the authority of the gentleman who telegraphs to the *Times*. Then he goes on to say:—‘This power of arbitrary confiscation would be a serious blow dealt at commercial interests, and would imperil mills and other commercial property exceeding in value a crore of rupees.’ Perhaps my hon’ble friend can tell me what mills are referred to as in jeopardy to the extent of one crore of rupees. ‘Corporations,’ he continues, ‘are proverbially high-handed’—(I believe in this case there are at least five members of the Chamber of Commerce on the Corporation referred to)—‘and the callous conduct of the Government in like cases in the past by no means justifies unlimited confidence to their commercial justice in the future.’

“Now, that is the sort of assertion that goes about all Europe in regard to legislation conducted by this Council. To understand the section at all you must study the Act of 1870, and as it has been recently altered, a certain knowledge of the history of the whole question is necessary, which probably those who have been attacking us have not taken the trouble to acquire. That history has been gone into pretty fully in to-day’s discussion, and I shall, for my part, only refer to it very briefly indeed. We need not go behind the Act of 1855, which was the basis of the subsequent legislation by the Government of India, namely, the later Act of 1875, and again the present Act of 1889 in regard to ports and port fees. That Act was, as has been pointed out here, a direction to Executive Governments in dealing with ports which were not brought under any special enactment. But subsequently—and among them Calcutta—various other ports have been brought under special enactments. The section which was introduced into the Act of 1870 was no doubt introduced in conformity, or in supposed conformity, with the law of 1855 as it stood then. There was very little discussion in the Bengal Council about it. I have referred to that discussion and have it here. But what little discussion there was, consisted in the commercial members extending and not limiting its scope. As originally proposed, it was only in cases of extension of the port within one mile of the then limits, and the commercial members said: ‘No. If this is the law, why limit it to one mile? Wherever the port is extended the law shall stand.’ This was accepted. But it does not seem to have attracted very much attention at the time.

“Subsequently, when the Act of 1855 was before the Government of India for amendment, it attracted attention. There were two memorials presented, and the whole matter was discussed by Mr. Hobhouse. The memorials were based upon the claim of riparian owners to have the right of ownership in the foreshore, which the Act of 1870 had jeopardised, and which they wanted to be in some way, by some side-wind, acknowledged and admitted into the Act of 1875, and this Sir Arthur Hobhouse distinctly refused to admit. I need not read all he said, but there are one or two points I wish to make clear about it. He said:—

‘Now, I mentioned that the riparian owners took a lively interest in this Bill, and the reason is that they are engaged in a controversy with the Port Commissioners, or the Bengal Government, or both, respecting some rights claimed by them over the foreshore down to low-water-mark. So they have addressed us on paper, and have also had the kindness to meet us in conference, and have urged that the new Bill ought to contain something to place them in some more favourable position, by recognising the fact of their claims, and at all events the possible validity of them, which, they say, is denied by their opponents. Now, there may be claims to private property of such a kind and on such a scale as to justify the Legislature in interfering to settle them. But these Calcutta controversies did not appear to us to be of such character. They appear to possess the characteristics of ordinary lawsuits, and we could not see why we should be called upon to interfere on one side or on the other. Indeed, I do not suppose that the riparian owners would be pleased if we interfered on the side of the public, and neither the Port Commissioners nor the Bengal Government have asked us to do so. Well, then, our position is that whatever right the public have against the claims of private property, and whatever protection private property has received against the claims of

the public, are to be found in the existing Act of 1855 and have been thereby ascertained and regulated for twenty years. It may indeed be for more than twenty years, but we have not looked behind the Act of 1855. At all events for twenty years the public have had the rights which the existing law gives them, and we could find no reason why those rights should now be lessened.

"The result of that was, that Mr. Hobhouse distinctly said that he looked upon these questions between riparian owners and the Government of Bengal, or rather the Port Commissioners, as questions for litigation and not for legislation. He distinctly rejected the claim of the memorialists to put anything into the Act, which should imply that our section in the Act of 1870 was in any way wrong or erroneous. As the Hon'ble Mr. Allen has pointed out, this is the identical section about which such very strong language has been used in the *Times* newspaper, and this identical section was deliberately repeated word for word and incorporated in the Act passed by the Government of India for the port of Rangoon—not before the discussion of 1870, but in 1879, after the whole question was before them. The main object of the section of 1870 was, as I understand it, to give riparian owners a warning that, in future, if they chose to erect jetties, or any of those other erections, on ground below high-water-mark, they must get permission to erect it, otherwise they were doing it at their own peril, and they must not expect compensation for it. This has been the law of the land for the last twenty years, and since 1875, I do not think anybody has heard any complaint.

"The Select Committee in altering the Bill necessarily gave the wording of the Act of 1870 a retrospective shape. So 'shall' they necessarily changed into 'may have been' so as to make it in accordance with the law of 1870; but they did not include what they might have included—an exception for anything built or erected before 1870. If they had done so, I do not think there would have been a word altered: it would have remained exactly as it stood, and I do not see how anybody could have taken exception to it. But it is perhaps not a very serious matter, as I understand the number of jetties built previous to 1870 is something exceedingly small. Now, however, the whole principle has been taken exception to. Well, on receiving the protest of the Hon'ble Mr. Moore, as a member of the Select Committee, I discussed the question with the members of the Select Committee, and the outcome of it was, the amendment as it stood to be introduced into the Council some three weeks ago. Well, that amendment apparently did not meet altogether with the views of the Chamber of Commerce. The point about the amendment was, that it tried to state explicitly the only circumstances under which compensation could be claimed, but that it did not satisfy the hon'ble member opposite (Mr. Moore), may be taken from the fact that his own amendment inserts the words 'or otherwise' after repeating practically what was in the amendment of the Hon'ble Sir Henry Harrison.

"Very well: finding that that did not satisfy him, and after reading the memorial of the Chamber of Commerce, the matter was subjected to further reconsideration, and the result was this section as it now stands. This section, as it now stands, is based exactly upon what Sir Arthur Hobhouse said in Council in 1875, that these questions between the Government and the riparian owners are questions not for legislation, but for the Law Courts. If they appealed to the Law Courts, the Law Courts would settle them. We decline to say or to give any indication of the circumstances under which compensation shall be given, except that the jetty or other erection shall have been lawfully erected and built. Nobody, I think, could criticise that section on the ground that the word 'lawfully' is not sufficiently clear. To say that it is ambiguous shows either one of two things—either that they want to include more than is lawful, or that they must be very hard put to find fault with our amendment. I must say for myself that I was inclined to prefer the amendment as originally drawn up, but now that I have seen the very weak nature of the objections taken to the amendment as it stands, I unhesitatingly give my opinion in favour of the new amendment.

"The only point which has not been really noticed in the discussion which has taken place to-day is, the objection that the Government of Bengal will not give the party injured an opportunity of being listened to. I observe that that remark was supported by my hon'ble friend on my left (Mr. Peacock), for many years Secretary to the Government of Bengal, and